



## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

#### 50 CFR Part 218

[Docket No. 230410-0096]

RIN 0648-BL77

### **Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Testing and Training Operations in the Eglin Gulf Test and Training Range**

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Final rule; notification of issuance of Letters of Authorization.

**SUMMARY:** NMFS, upon request from the U.S. Department of the Air Force (USAF), issues these regulations pursuant to the Marine Mammal Protection Act (MMPA) to govern the taking of marine mammals incidental to testing and training activities to be conducted in the Eglin Gulf Test and Training Range (EGTTR) from 2023 to 2030 in the Gulf of Mexico. The USAF's activities qualify as military readiness activities pursuant to the MMPA, as amended by the National Defense Authorization Act for Fiscal Year 2004 (2004 NDAA). These regulations, which allow for the issuance of Letters of Authorization (LOA) for the incidental take of marine mammals during the described activities and timeframes, prescribe the permissible methods of taking and other means of effecting the least practicable adverse impact on marine mammal species and their habitat, and establish requirements pertaining to the monitoring and reporting of such taking.

**DATES:** *Effective dates:* Amendatory instruction 1 is effective April 13, 2023, and amendatory instruction 2 is effective from April 13, 2023, through April 13, 2030.

*Applicability dates:* This rule is applicable to the USAF on April 13, 2023, through April 13, 2030.

**ADDRESSES:** A copy of the USAF's application, NMFS' proposed and final rules and subsequent LOA for the existing regulations, and other supporting documents and documents cited herein may be obtained online at [www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities](http://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities).

In case of problems accessing these documents, please use the contact listed here (see **FOR FURTHER INFORMATION CONTACT**).

**FOR FURTHER INFORMATION CONTACT:** Robert Pauline, Office of Protected Resources, NMFS, (301) 427-8401.

**SUPPLEMENTARY INFORMATION:**

**Purpose of Regulatory Action**

These regulations, issued under the authority of the MMPA (16 U.S.C. 1361 *et seq.*), provide the framework for authorizing the take of marine mammals incidental to the USAF's testing and training activities (which qualify as military readiness activities) from air-to-surface operations that involve firing live or inert munitions, including missiles, bombs, and gun ammunition, from aircraft at various types of targets on the water surface. Live munitions used in the EGTTR are set to detonate either in the air a few feet above the water, instantaneously upon contact with the water or target, or approximately 5 to 10 feet (ft) (1.5 to 3 meters (m)) below the water surface. There will also be training exercises for Navy divers that require the placement of small explosive charges by hand to disable live mines.

Eglin Air Force Base (AFB) will conduct operations in the existing Live Impact Area (LIA). In addition, the USAF will also create and use a new, separate LIA within the EGTTR that would be used for live missions in addition to the existing LIA. Referred

to as the East LIA, it is located approximately 40 nautical miles (nmi) (74 kilometers (km)) southeast of the existing LIA.

NMFS received an application from the USAF requesting 7-year regulations and an authorization to incidentally take individuals of multiple species of marine mammals (“USAF’s rulemaking/LOA application” or “USAF’s application”). Take is anticipated to occur by Level A and Level B harassment incidental to the USAF’s training and testing activities, with no serious injury or mortality expected or authorized.

Section 101(a)(5)(A) of the MMPA (16 U.S.C. 1371(a)(5)(A)) directs the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if, after notice and public comment, the agency makes certain findings and issues regulations that set forth permissible methods of taking pursuant to that activity, as well as monitoring and reporting requirements. Section 101(a)(5)(A) of the MMPA and the implementing regulations at 50 CFR part 216, subpart I, provide the legal basis for issuing this final rule and the subsequent LOAs. As directed by this legal authority, this final rule contains mitigation, monitoring, and reporting requirements.

The 2004 NDAA (Pub. L. 108-136) removed the “small numbers” and “specified geographical region” limitations indicated above and amended the definition of “harassment” as applied to a “military readiness activity.” The activity for which incidental take of marine mammals is being requested addressed here qualifies as a military readiness activity.

More recently, section 316 of the NDAA for Fiscal Year 2019 (2019 NDAA) (Pub. L. 115-232), signed on August 13, 2018, amended the MMPA to allow incidental take rules for military readiness activities under section 101(a)(5)(A) to be issued for up

to 7 years. Prior to this amendment, all incidental take rules under section 101(a)(5)(A) were limited to 5 years.

### **Summary of Major Provisions within the Final Rule**

The following is a summary of the primary provisions of this final rule regarding the USAF's activities. These provisions include, but are not limited to:

- Use of live munitions with surface or subsurface detonations is restricted to the existing Live Impact Area (LIA) and the new East LIA;
- Use of live munitions in the western part of the existing LIA and new East LIA is restricted based on specified setbacks from the 100-meter isobath. The 100-m isobath is the minimum depth at which the majority of Rice's whale detections have occurred. The setbacks are equivalent to the modeled threshold distances where each mission-day category would cause the onset of permanent threshold shift (PTS) in the Rice's whale;
- Use of inert munitions is prohibited between the 100-meter to 400-meter isobaths throughout the EGTTR, which encompasses the area in which the vast majority of Rice's whale detections have occurred;
- Gunnery missions must be conducted at least 500 meters landward of the 100-meter isobath; and
- Use of 105 mm Training Rounds (TR) containing decreased explosive material is required during live nighttime gunnery missions.
- Use of vessel-based, aerial-based and video-based monitoring platforms for mission activities;
- Employment of protected species observers (PSOs) who have completed Eglin's Marine Species Observer Training Course developed in cooperation with NMFS;
- Implementing two passive acoustic monitoring (PAM) studies (pending availability of funding); and

- Submission of annual and final comprehensive monitoring reports that will record all occurrences of marine mammals and any behavior or behavioral reactions observed, any observed incidents of injury or behavioral harassment, and any required mission delays, relocations or cancellations.

Additionally, the rule includes an adaptive management component that allows for timely modification of mitigation or monitoring measures based on new information, when appropriate.

## **Background**

The MMPA prohibits the “take” of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of proposed authorization is provided to the public for review and the opportunity to submit comments.

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stocks and will not have an unmitigable adverse impact on the availability of the species or stocks for taking for subsistence uses where relevant, including by Alaska Natives. Further, NMFS must prescribe the permissible methods of taking and other means of effecting the least practicable adverse impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in this rule as “mitigation measures”); and requirements pertaining to the monitoring and

reporting of such takings. The MMPA defines “take” to mean to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. The Analysis and Negligible Impact Determination section below discusses the definition of “negligible impact.”

The NDAA for Fiscal Year 2004 (2004 NDAA) (Pub. L. 108-136) amended section 101(a)(5) of the MMPA to remove the “small numbers” and “specified geographical region” provisions indicated above and amended the definition of “harassment” as applied to a “military readiness activity.” The definition of harassment for military readiness activities (section 3(18)(B) of the MMPA) is (i) Any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild (Level A Harassment); or (ii) Any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered (Level B harassment). In addition, the 2004 NDAA amended the MMPA as it relates to military readiness activities such that the least practicable adverse impact analysis shall include consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

More recently, section 316 of the NDAA for Fiscal Year 2019 (2019 NDAA) (Pub. L. 115-232), signed on August 13, 2018, amended the MMPA to allow incidental take rules for military readiness activities under section 101(a)(5)(A) to be issued for up to 7 years. Prior to this amendment, all incidental take rules under section 101(a)(5)(A) were limited to 5 years.

### **Summary and Background of Request**

On January 18, 2022, NMFS received an application from the USAF for authorization to take marine mammals by Level A and Level B harassment incidental to

training and testing activities (categorized as military readiness activities) in the EGTTR for a period of 7 years. On June 17, 2022, NMFS received an adequate and complete application for missions that would include air-to-surface operations that involve firing live or inert munitions, including missiles, bombs, and gun ammunition from aircraft at targets on the water surface. The types of targets used vary by mission and primarily include stationary, remotely controlled, and towed boats, inflatable targets, and marker flares. Live munitions used in the EGTTR are set to detonate either in the air a few feet above the water surface (airburst detonation), instantaneously upon contact with the water or target (surface detonation), or approximately 5 to 10 feet (1.5 to 3 m) below the water surface (subsurface detonation). On July 17, 2022, we published a notice of receipt (NOR) of application in the **Federal Register** (87 FR 42711), requesting comments and information related to the USAF's request. The public comment period was open for 30 days. We reviewed and considered all comments and information received on the NOR in development of this final rule. On February 7, 2023, we published a notice of proposed rulemaking (88 FR 8146) and requested comments and information related to the USAF's request for 30 days. All substantive comments received during the NOR and the proposed rulemaking comment periods were considered in developing this final rule. Comments received on the proposed rule are addressed in this final rule in the Comments and Responses section.

This is the second time NMFS has promulgated incidental take regulations pursuant to the MMPA relating to similar military readiness activities in the EGTTR. On February 8, 2018, NMFS promulgated a rulemaking and issued an LOA for takes of marine mammals incidental to Eglin AFB's training and testing operations in the EGTTR (83 FR 5545).

Most operations during the current effective period are a continuation of the same operations conducted by the same military units during the previous mission period.

There will, however, be an increase in the annual quantities of all general categories of munitions (bombs, missiles, and gun ammunition) under the USAF's planned activities, except for live gun ammunition, which will be used less over the next mission period. The highest net explosive weight (NEW) of the munitions under the USAF's activities will be 945 pounds (lb) (430 kilograms (kg)), which was also the highest NEW for the previous mission period. Live missions planned for the 2023–2030 period will be conducted in the existing Live Impact Area (LIA) within the EGTTR. Certain missions may also be conducted in the East LIA, which is a new, separate area within the EGTTR where live and inert munitions will be used.

The USAF's rulemaking/LOA application reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements. EGTTR training and testing operations are critical for achieving military readiness and the overall goals of the National Defense Strategy. The regulations cover testing and training activities in the EGTTR and will be effective for seven years, beginning from the date of issuance.

### **Description of the Specified Activity**

A detailed description of the specified activity was provided in our **Federal Register** notice of proposed rulemaking (88 FR 8146; February 7, 2023); please see that notice of proposed rulemaking or the USAF's application for more information. The USAF requested authorization to take marine mammals incidental to conducting training and testing activities in the EGTTR. The USAF has determined that acoustic and explosives stressors are most likely to result in impacts on marine mammals that could rise to the level of harassment, qualify as take under the MMPA, and NMFS concurs with this determination. Eglin plans to conduct military aircraft missions within the EGTTR that involve the employment of multiple types of live (explosive) and inert (non-explosive) munitions (*i.e.* missiles, bombs, and gun ammunition) against various surface

targets. Munitions may be delivered by multiple types of aircraft including, but not limited to, fighter jets, bombers, and gunships.

Detailed descriptions of these activities are described in the Eglin Gulf Test and Training Range (EGTTR) Range rulemaking/LOA application (<https://www.fisheries.noaa.gov/action/incidental-take-authorization-us-air-force-eglin-gulf-testing-and-training>) and are summarized here.

#### *Dates and Duration*

The specified activities will occur at any time during the 7-year period of validity of the regulations. The planned amount of training and testing activities are described in the **Detailed Description of the Specified Activities** section.

#### *Geographical Region*

The Eglin Military Complex encompasses approximately 724 square miles (1,825 km<sup>2</sup>) of land in the Florida Panhandle and consists of the Eglin Reservation in Santa Rosa, Okaloosa, and Walton Counties, and property on Santa Rosa Island and Cape San Blas. The EGTTR is the airspace controlled by Eglin AFB over the Gulf of Mexico, beginning 3 nautical miles (nmi) (5.56 km) from shore, and the underlying Gulf of Mexico waters. The EGTTR extends southward and westward off the coast of Florida and encompasses approximately 102,000 nmi (349,850 km<sup>2</sup>). It is subdivided into blocks of airspace that consist of Warning Areas W-155, W-151, W-470, W-168, and W-174 and Eglin Water Test Areas 1 through 6 (Figure 1). Most of the blocks are further subdivided into smaller airspace units for scheduling purposes (for example, W-151A, B, C, and D). Although Eglin AFB may use any portion of the EGTTR, the majority of training and testing operations planned for the 2023–2030 mission period would occur in Warning Area W-151. The nearshore boundary of W-151 parallels much of the coastline of the Florida Panhandle and extends horizontally from 3 nmi (5.56 km) offshore to approximately 85 to 100 nmi (158 to 185 km) to offshore, depending on the specific portion of its outer

boundary. W-151 encompasses approximately 10,247 nmi<sup>2</sup> (35146 km<sup>2</sup>) and includes water depths that range from approximately 5 to 720 m. The existing LIA, which is the portion of the EGTTR where the use of live munitions is currently authorized, lies mostly within W-151. The existing LIA encompasses approximately 940 nmi<sup>2</sup> (3,224 km<sup>2</sup>) and includes water depths that range from approximately 30 to 145 m. This is where live munitions within the EGTTR are currently used in the existing LOA (83 FR 5545; February 8, 2018) and where the Gulf Range Armament Test Vessel (GRATV) is anchored. The GRATV remains anchored at a specific location during a given mission; however, it is mobile and relocated within the LIA based on mission needs.

The USAF's planned activities provide for the creation of a new, separate area within the EGTTR that will be used for live missions in addition to the existing LIA. This area, herein referred to as the East LIA, is located approximately 40 nmi offshore of Eglin AFB property on Cape San Blas. Cape San Blas is located on St. Joseph Peninsula in Gulf County, Florida, approximately 90 mi (144 km) southeast of the Eglin Reservation. Eglin AFB facilities on Cape San Blas remotely support EGTTR operations via radar tracking, telemetry, and other functions. The East LIA is circular-shaped and has a radius of approximately 10 nmi (18.5 km) and a total area of approximately 314 nmi<sup>2</sup>. Water depths range from approximately 35 to 95 m. The East LIA will allow Eglin AFB to maximize the flight range for large-footprint weapons and minimize the distance, time, and cost of deploying support vessels and targets. Based on these factors, the East LIA will allow testing of weapon systems and flight profiles that cannot be conducted within the constraints of the existing LIA.

#### *Detailed Description of the Specified Activities*

This section provides descriptions of each military user group's planned EGTTR operations, as well as information regarding munitions planned to be used during the operations. This information includes munition type, category, net explosive weight

(NEW), detonation scenario, and annual quantity planned to be expended in the EGTTR. NEW applies only to live munitions and is the total mass of the explosive substances in a given munition, without packaging, casings, bullets, or other non-explosive components of the munition. Note that for some munitions the warhead is removed and replaced with a telemetry package that tracks the munition's path and/or Flight Termination System (FTS) that ends the flight of the munition in a controlled manner. These munitions have been categorized as live munitions with NEWs that range from 0.30 to 0.70 lb (0.13 to 0.31 kg). While certain munitions with only FTS may be considered inert due to negligible NEW, those contained here are considered to be live with small amounts of NEW. The detonation scenario applies only to live munitions which are set to detonate in one of three ways: (1) in the air a few feet above the water surface, referred to as airburst or height of burst (HOB); (2) instantaneously upon contact with the water or target on the water surface; or (3) after a slight delay, up to 10 milliseconds, after impact, which would correspond to a subsurface detonation at a water depth of approximately 5 to 10 ft (1.5 to 3 m). Estimated take is only modeled for scenarios (2) and (3). The planned annual expenditures of munitions are the quantities determined necessary to meet the mission requirements of the user groups.

Live missions planned for the 2023–2030 period would be conducted in the existing LIA and the East LIA, depending on the mission type and objectives. Live missions that involve only airburst or aerial target detonations would continue to be conducted in or outside the LIA in any portion of the EGTTR; such detonations have no appreciable effect on marine mammals because there is negligible transmission of pressure or acoustic energy across the air–water interface. Use of inert munitions and live air-to-surface gunnery operations would also continue to occur in or outside the LIA, subject to required mitigation and monitoring measures.

Eglin AFB plans to implement the following actions in the EGTTR which would be conducted in the existing LIA and the East LIA, depending on the mission type and objectives:

- (1) 53rd Weapons Evaluation Group missions that involve air-to-surface tests various types of munitions against small target boats, and air-to-air missile testing;
- (2) Continuation of the Air Force Special Operations Command (AFSOC) training missions in the EGTTR primarily involving air-to-surface gunnery, bomb, and missile exercises including AC-130 gunnery training, CV-22 training, and bomb and missile training;
- (3) 96th Operations Group missions including AC-130 gunnery testing against floating marker targets on the water surface, and other aircraft air-to-surface testing; and 780th Test Squadron weapons testing of air-launched cruise missiles, air-to-air missiles, air-to-surface missiles, and surface-to-air missiles using live and inert munitions against targets on the water surface; and
- (4) Naval School Explosive Ordnance Disposal (NAVSCOLEOD) training missions that involve students diving and placing small explosive charges adjacent to inert mines.

#### 53rd Weapons Evaluation Group

The 53rd Weapons Evaluation Group (53 WEG) conducts the USAF's air-to-ground Weapons System Evaluation Program (WSEP) for testing various types of live and inert munitions against small target boats. This testing is conducted to develop tactics, techniques, and procedures (TTP) to be used by USAF aircraft to counter small, maneuvering, hostile vessels. Missions planned in the EGTTR for the 2023–2030 period would involve the use of several types of aircraft. USAF, Air National Guard, and U.S. Navy units would support these missions. Live munitions would be deployed against static (anchored), remotely controlled, and towed targets. Static and remotely controlled

targets would consist of stripped boat hulls with simulated systems and, in some cases, heat sources. Various types of live and inert munitions are used during 53 WEG missions in the EGTTT, including missiles, bombs, and gun ammunition. Table 1 presents information on the munitions planned for 53 WEG air-to-surface missions in the EGTTT during the 2023–2030 period.

**Table 1--Planned Munitions for 53 WEG Air-to-Surface Missions in the EGTTT**

Category	Net Explosive Weight (lb)/(kg)	Destination Scenario	Annual Quantity
Live Munitions			
Rocket	9.1 (4.1)	Surface	12
Missile	240.26 (108.9)	Surface	4
Missile	240.26 (108.9)	Surface	3
Missile	240.26 (108.9)	Surface	3
Missile	150 (68)	Surface	5
Missile	145 (65.7)	Surface	5
Missile	150 (68)	Surface	5
Missile	145 (65.7)	Surface	4
Missile	150 (68)	Surface	5
Missile	29.1 (13.2)	Surface	4
Missile	29.94 (13.6)	Surface	4
Missile	27.41 (12.4)	Surface	4
Missile	27.38 (12.4)	Surface	4
Missile	20.16 (9.1)	Surface	4
Bomb	108.6 (49.5)	HOB	8
Bomb	0.34(0.1) <sup>a</sup>	HOB/Surface	8
Bomb	0.39(0.1) <sup>a</sup>	Surface	4
Missile	0.70 (0.31) <sup>a</sup>	Surface	2
Missile	0.70 (0.31) <sup>a</sup>	Surface	2
Missile	0.70(0.31) <sup>a</sup>	Surface	2

Missile	0.70(0.31) <sup>a</sup>	Surface	2
Missile	27.47(12.5)	Surface	4
Bomb	6.88 (3.1)	Surface	2
Bomb	6.88 (3.1)	Surface	4
Missile	8.14 (3.7)	Surface	4
Bomb	193 (87.5)	Surface	4
Bomb	193	Surface	4
Gun Ammunition	4.7	Surface	100
Inert Munitions			
Missile	N/A	N/A	4
Missile	N/A	N/A	4
Missile	N/A	N/A	4
Missile	N/A	N/A	4
Bomb	N/A	N/A	8
Bomb	N/A	N/A	32
Bomb	N/A	N/A	16
Bomb	N/A	N/A	16
Bomb	N/A	N/A	2
Bomb	N/A	N/A	16
Bomb	N/A	N/A	16
Bomb	N/A	N/A	2
Bomb	N/A	N/A	2
Bomb	N/A	N/A	8
Bomb	N/A	N/A	4
Bomb	N/A	N/A	4
Bomb	N/A	N/A	10
Bomb	N/A	N/A	4
Bomb	N/A	N/A	4
Bomb	N/A	N/A	2
Bomb	N/A	N/A	4

Gun Ammunition	0.09 (0.04)	N/A	16,000
Gun Ammunition	N/A	N/A	16,000
Gun Ammunition	N/A	N/A	16,000
Decoy System	N/A	N/A	6

<sup>a</sup> Warhead replaced by FTS/Tactical Missile (TM). Identified NEW is for the FTS.  
EGTTR = Eglin Gulf Test and Training Range

The 53 WEG also conducts live air-to-air missile testing in the EGTTR. These missions also include firing inert gun ammunition and releasing flares and chaff from aircraft. Air-to-air missile testing during these missions specifically involves firing live missiles at sub-and full-scale Aerial Targets to evaluate the effectiveness of missile delivery techniques. These missions involve the use of several types of fighter aircraft.

Table 2 presents information on the munitions planned to be used during 53 WEG missions in the EGTTR.

**Table 2--Planned Munitions for 53 WEG Air-to-Air Missions in the EGTTR**

Category	Net Explosive Weight (lb)/(kg)	Detonation Scenario	Annual Quantity
Live Munitions			
Missile	113.05 (51.3)	HOB	24
Missile	113.05 (51.3)	HOB	10
Missile	113.05 (51.3)	HOB	8
Missile	102.65 (46.5)	HOB	14
Missile	117.94 (63.5)	HOB/Surface	4
Missile	102.65 (46.5)	HOB	18
Missile	60.25 (27.3)	HOB	7
Missile	67.9 (30.8)	HOB/Surface	10
Missile	60.25 (27.3)	HOB	24
Missile	60.55 (27.3)	HOB	90
Inert Munitions			
Missile	N/A	N/A	4

Gun Ammunition	N/A	N/A	80,000
Gun Ammunition	N/A	N/A	6,000
Flare	N/A	N/A	1,800
Chaff	N/A	N/A	6,000
Chaff	N/A	N/A	1,500

EGTTR = Eglin Gulf Test and Training Range; HOB = height of burst; lb= pound(s); mm = millimeter(s); N/A = not applicable

### Air Force Special Operations Command Training

The Air Force Special Operations Command (AFSOC) plans to continue conducting training missions during the 2023–2030 period. These missions primarily involve air-to-surface gunnery, bomb, and missile exercises. Gunnery training in the EGTTR involves firing live rounds from AC-130 gunships at targets on the water surface. Gun ammunition used for this training primarily includes 30-millimeter (mm) High Explosive (HE) and 105 mm HE rounds. A standard 105 mm HE round has a NEW of 4.7 lb. The Training Round (TR) variant of the 105 mm HE round, which has a NEW of 0.35 lb, is used by AFSOC for nighttime missions. This TR was developed to have less explosive material to minimize potential impacts to protected marine species, which could not be adequately surveyed at night by earlier aircraft instrumentation. Since the development of the 105 mm HE TR, AC-130s have been equipped with low-light electro-optical and infrared sensor systems that provide excellent night vision. Targets used for AC-130 gunnery training include Mark (Mk)-25 marine markers and inflatable targets. During each gunnery training mission, gun firing can last up to 90 minutes but typically lasts approximately 30 minutes. Live firing is continuous, with pauses usually lasting well under 1 minute and rarely up to 5 minutes. Table 3 presents information on the rounds planned for AC-130 gunnery training by AFSOC.

**Table 3--Planned Rounds for AC-130 Gunnery Training in the EGTTR**

Net Explosive Weight (lb)/(kg)	Detonation Scenario	Number of Missions	Rounds per Mission	Annual Quantity
Daytime Missions				
4.7 (2.1)	Surface	25	30	750
0.1 (0.04)			500	12,500
Nighttime Missions				
0.35 (0.2)	Surface	45	30	1,350
0.1 (0.04)			500	22,500
Total		70		37,100

EGTTR = Eglin Gulf Test and Training Range

The 8th Special Operations Squadron (8 SOS) under AFSOC conducts training in the EGTTR using the tiltrotor CV-22 Osprey. This training involves firing .50 caliber rounds from CV-22s at floating marker targets on the water surface. The .50 caliber rounds do not contain explosive material and, therefore, do not detonate. Flight procedures for CV-22 training are similar to those described for AC-130 gunnery training, except that CV-22 aircraft typically operate at much lower altitudes (100 to 1,000 feet (30.48 to 304.8 m) (AGL) than AC-130 gunships (6,000 to 20,000 feet (1,828 to 6,096 m) AGL). Like AC-130 gunships, CV-22s are equipped with highly sophisticated electro-optical and infrared sensor systems that allow advanced detection capability during day and night. Table 4 presents information on the rounds planned for CV-22 training missions.

**Table 4--Planned Rounds for CV-22 Training in the EGTTR**

Net Explosive Weight (lb)	Detonation Scenario	Number of Missions	Rounds per Mission	Annual Quantity
Daytime Missions				
N/A	Surface	25	600	15,000
Nighttime Missions				
N/A	Surface	25	600	15,000
Total		50		30,000

In addition to AC-130 gunnery and CV-22 training, AFSOC also conducts other air-to-surface training in the EGTTTR using various types of live and inert bombs and missiles as shown in Table 5. These munitions are launched from various types of aircraft against small target boats, and they either detonate on impact with the target or at a programmed HOB.

**Table 5--Planned Munitions for AFSOC Bomb and Missile Training in the EGTTTR**

Category	Net Explosive Weight (lb) (kg)	Detonation Scenario	Annual Quantity
Live Munitions			
Missile	4.58 (2.1)	HOB	100
Missile	20.0 (9.07)	HOB	70
Rocket	2.3 (1.0)	Surface	400
Bomb	198.0 (89.8)/298.0 (135.1)	Surface	30
Bomb	151.0 (98.4)	Surface	30
Bomb	37.0 (16.7)	HOB	30
Bomb	36.0 (16.3)	HOB	40
Inert Munitions			
Gun Ammunition	N/A	N/A	30,000
Bomb	N/A	N/A	30
Bomb	N/A	N/A	30
Bomb	N/A	N/A	30
Bomb	N/A	N/A	50

AFSOC = Air Force Special Operations Command; height of burst; lb = pound(s); Mk = Mark; N/A = not applicable

### 96th Operations Group

Three units under the 96th Operations Group (96 OG) plan to conduct missions in the EGTTTR during the 2023–2030 period: the 417th Flight Test Squadron (417 FLTS), the 96th Operational Support Squadron (96 OSS), and the 780th Test Squadron (780 TS).

The 417 FLTS plans to continue conducting AC-130 systems and munitions testing in the EGTTT. AC-130 gunnery testing is generally similar to activities previously described for AFSOC AC-130 gunnery training.

Table 6 presents information on the munitions planned for AC-130 testing in the EGTTT during the 2023–2030 mission period.

**Table 6--Planned Rounds for AC-130 Gunnery Testing in the EGTTT**

Category	Net Explosive Weight (lb)/(kg)	Detonation Scenario	Annual Quantity
Live Munitions			
Missile	4.58 (2.1)	Surface	10
Missile	20.0 (9.1)	Surface	10
Bomb	37.0 (16.8)	Surface	6
Bomb	37.0 (16.8)	Surface	10
Gun Ammunition	4.7 (2.1)	Surface	60
Gun Ammunition	0.35 (0.2)	Surface	60
Gun Ammunition	0.1 (0.1)	Surface	99

EGTTT = Eglin Gulf Test and Training Range

The 96 OSS plans to conduct air-to-surface testing in the EGTTT using assorted live missiles and live and inert precision-guided bombs to support testing requirements for multiple programs. The planned munitions would include captive carry and munitions employment tests. During munition employment tests, the planned munitions would be launched from aircraft at various types of static and moving targets on the water surface. Table 7 presents information on the munitions planned by the 96 OSS for testing in the EGTTT.

**Table 7--Planned Munitions for 95 OSS Testing in the EGTTT**

Category	Net Explosive Weight (lb)/(kg)	Detonation Scenario	Annual Quantity
Live Munitions			

Missile	20.0 (9.1)	Surface	36
Missile	7.9 (3.6)	HOB	1
Bomb	37.0 (16.8)	Surface	2
Inert Munitions			
Bomb	N/A	N/A	2
Bomb	N/A	N/A	10
Bomb	N/A	N/A	1

EGTTR = Eglin Gulf Test and Training Range

The 780 TS, the Air Force Life Cycle Management Center, and the U.S. Navy jointly conduct some test missions in the EGTTR. These missions use precision-guided bombs. Some munitions would detonate at a HOB of approximately 5 ft (0.30 m); however, these detonations are assumed to occur at the surface for the impact analysis. Other munitions would detonate either at a HOB of approximately 7 to 14 ft (2.1 to 4.2 m) or upon impact with the target (surface). For simultaneous munition launches, two munitions would be launched from the same aircraft at approximately the same time to strike the same target. These simultaneously launched munitions would strike the target within approximately 5 seconds or less of each other. Such detonations would be considered a single event, with the associated NEW being doubled for a conservative impact analysis.

Two types of targets are typically used for 780 TS tests: Container Express (CONEX) targets and hopper barge targets. CONEX targets typically consist of up to five CONEX containers strapped, braced, and welded together to form a single structure. A hopper barge is a common type of barge that cannot move itself; a typical hopper barge measures approximately 30 ft (9.1 m) by 12 ft (3.6 m) by 125 ft (38.1 m).

Other 780 TS tests in the EGTTR during the 2023–2030 mission period may include operational testing of a third bomb munition. These tests may involve live and inert testing of the munition against target boats.

Table 8 presents information on the munitions planned for these 780 TS missions in the EGTTTR during the 2023–2030 period.

**Table 8--Planned Munitions for Precision Strike Weapon Missions**

Category	Net Explosive Weight (lb)/(kg)	Detonation Scenario	Annual Quantity
Live Munitions			
Missile	240.26 (108.9)	Surface	2
Bomb	37.0 (16.8)	HOB/Surface	2
Bomb <sup>a</sup>	74.0 (33.35)	HOB/Surface	2
Bomb	22.84 (10.4)	HOB/Surface	2
Inert Munitions			
Missile	N/A	N/A	4
Bomb	N/A	N/A	4
Bomb	N/A	N/A	4
Bomb	N/A	N/A	1

<sup>a</sup> NEW is doubled for simultaneous launch.

EGTTTR = Eglin Gulf Test and Training Range; lb = pound(s); N/A = not applicable

The 780 TS, along with the Air Force Life Cycle Management Center and U.S. Navy, plans to jointly conduct air-to-air missile testing in the EGTTTR. These missions would involve the use of missiles; all missiles used in these tests would be inert. Table 9 presents information on the munitions planned for air-to-air missile testing missions in the EGTTTR during the 2023–2030 mission period.

**Table 9--Planned Munitions for 780 TS Air-to-Air Missile Testing in the EGTTTR**

Category	Net Explosive Weight (lb)	Detonation Scenario	Annual Quantity
Missile	N/A	N/A	6
Missile	N/A	N/A	10
Missile	N/A	N/A	15

EGTTTR = Eglin Gulf Test and Training Range; lb = pound(s); N/A = not applicable

The 780 TS plans to test the ability of other missiles to track and impact moving target boats in the EGTTR as shown in Table 10. The test targets would be remotely controlled boats, including the 25-foot High-Speed Maneuverable Surface Target (HSMST) (foam filled) and 41-foot (12.5 m) Coast Guard Utility Boat (metal hull).

**Table 10--Planned Munitions for 780 TS Other Missile Testing in the EGTTR**

Category	Net Explosive Weight (lb)/(kg)	Detonation Scenario	Annual Quantity
Missile	35.95 (16.3)	HOB	6
Missile	27.47 (11.1)	HOB	8

EGTTR = Eglin Gulf Test and Training Range; HOB = height of burst; lb = pound(s)

The 780 TS plans to test an air-to-surface tactical missile system against static and moving target boats in the EGTTR. These missiles shown in Table 11 would target foam-filled fiberglass boats approximately 25 ft (7.62 m) in length that are either anchored or towed by a remotely controlled (HSMST).

**Table 11--Planned Munitions for 780 TS Other Missile Testing in the EGTTR**

Category	Net Explosive Weight (lb)/(kg)	Detonation Scenario	Annual Quantity
Missile	34.08 (14.5)	Surface	3

The 780 TS plans to conduct surface-to-air testing of missiles in the EGTTR. These missiles are expected to be fired from the A-15 launch site on Santa Rosa Island in the EGTTR. Detailed operational data for this testing are not yet available. Standard inventory missiles would be used and up to eight tests of one type and two tests of another type per year are planned as shown in Table 12.

**Table 12--Planned Munitions for 780 TS Surface-to-air Testing in the EGTTR**

Category	Net Explosive Weight (lb)/(kg)	Detonation Scenario	Annual Quantity
Missile	145.0 (65.7) <sup>a</sup>	N/A (drone target)	8
Missile	145.0 (65.7) <sup>a</sup>	N/A (drone target)	2

<sup>a</sup> Assumed for impact analysis.

Hypersonic weapons are capable of traveling at least five times the speed of sound, referred to as Mach 5. While conventional weapons typically rely on explosive warheads to inflict damage on a target, hypersonic weapons typically rely on kinetic energy from high-velocity impact to inflict damage on targets. For the purpose of assessing impacts, the kinetic energy of a hypersonic weapon may be correlated to energy release in units of feet-lb or trinitrotoluene (TNT) equivalency.

The 780 TS supports hypersonic weapon programs which are presented in Table 13.

780 TS plans to conduct testing of one type of hypersonic missile, which would involve air launches through a north-south corridor within the EGTTR to a target location on the water surface. The dimensions and orientation of the test flight corridor within the EGTTR for these tests are to be determined; the flight corridor is expected to be 300 to 400 nmi (555 to 740 km) in total length. Live types of missiles would be fired from the southern portion of the EGTTR into either the existing LIA or planned East LIA. Up to two live of these live missiles per year are planned to be tested in the EGTTR during the 2023–2030 mission period.

The 780 TS in coordination with the U.S. Army plans to conduct testing of another type of hypersonic missile in the EGTTR. Some testing of these missiles is expected to involve surface launches from the A-15 launch site on Santa Rosa Island. The dimensions and orientation of the test flight corridor within the EGTTR for these tests are to be determined; the flight corridor is expected to be 162 to 270 nmi (300 to 500 km) in total length. For tests that involve a live warhead on these missiles, they would be preset to detonate at a specific height above the water surface (HOB/airburst) and could occur in any portion of the EGTTR. Any surface strikes planned with these live missiles would be required to be in the existing LIA or East LIA. Like inert of the previously mentioned

missile type, inerts of this type could occur in any portion of the EGTTT, except between the 100-m and 400-m isobaths to prevent impacts to the Rice's whale.

**Table 13—Planned Munitions for 780 TS Hypersonic Weapon Testing in the EGTTT**

Category	Net Explosive Weight (lb)/(kg)	Detonation Scenario	Annual Quantity
Live Munitions			
Hypersonic Weapon	350 (158.7) <sup>a</sup>	Surface	2
Hypersonic Weapon	46 (158.7) <sup>a</sup>	HOB	2
Inert Munitions			
Hypersonic Weapon	N/A	N/A	2

<sup>a</sup> Net explosive weight at impact/detonation

The 780 TS, in coordination with the Air Force Research Laboratory, plans to conduct sink at-sea live-fire training exercises (SINKEX) testing in the EGTTT. SINKEX exercises would involve the sinking of vessels, typically 200-400 ft (61 -122 m) in length, in the existing LIA. The types of munitions that would be used for SINKEX testing is controlled information and, therefore, not identified (Table 14).

**Table 14—Planned 780 TS SINKEX Exercises in the EGTTT**

Type	Category	Net Explosive Weight (lb)	Detonation Scenario	Annual Quantity
SINKEX	Vessel Sinking Exercise	Not Available	Not Available	2

The 780 TS plans to lead or support other types of testing in the EGTTT as shown in Table 15. These missions would primarily include testing live and inert munitions against targets on the water surface, such as boats and barges. Some of the tests would involve munitions with NEWs of up to 945 lb, which is the highest NEW associated with the munitions analyzed in this LOA application

**Table 15—Planned Munitions for Other 780 Test Squadron Testing in the EGTTT**

Category	Net Explosive Weight (lb)/(kg)	Detonation Scenario	Target Type	Annual Quantity
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Live Munitions				
Bomb	945 (428.5)	Subsurface	TBD	4 to 8
Bomb	945 (428.5) or less	HOB	TBD	2
Bomb	0.4 (0.2)	HOB/Surface	Small Boat	4
Bomb	0.4 (0.2)	HOB/Surface	Small Boat	4
Inert Munitions				
Missile	N/A	N/A	TBD	7
Booster	N/A	N/A	TBD	1
Bomb	N/A	N/A	Water Surface and Barge	3
Torpedo	N/A	N/A	Water Surface	2

EGTTR = Eglin Gulf Test and Training Range; HOB = height of burst; lb = pound; (N/A = not applicable; TBD = to be determined

The 96 OG plans to continue expanding approximately nine inert bombs a year in the EGTTR for testing purposes. The bombs are expected to be up to 2,000 lb (907 kg) in total weight. For the impact analysis, the bombs to be used by the 96 OG in the EGTTR during the 2023–2030 mission period are assumed to be 2,000 lb (907 kg) General Purpose (GP) inert bombs (Table 16).

**Table 16—Planned Munitions for other 96 OG Inert Bomb Testing in the EGTTR**

Category	Net Explosive Weight (lb)	Detonation Scenario	Annual Quantity
Bomb <sup>a</sup>	N/A	N/A	9

<sup>a</sup>Assumed for impact analysis.

EGTTR = Eglin Gulf Test and Training Range; N/A = not applicable

#### Naval School Explosive Ordnance Disposal (NAVSCOLEOD)

NAVSCOLEOD plans to conduct training missions in the EGTTR which would include Countermeasures (MCM) exercises to teach NAVSCOLEOD students techniques for neutralizing mines underwater (Table 17). Underwater MCM training exercises are conducted in nearshore waters and primarily involve diving and placing small explosive charges adjacent to inert mines by hand; the detonation of such charges disables live mines. NAVSCOLEOD training is conducted offshore of Santa Rosa Island and in other

locations and has not yet extended into the EGTTR. NAVSCOLEOD training planned for the 2023–2030 mission period would extend approximately 5 nmi (9.26 km) offshore of Santa Rosa Island, in the EGTTR. Up to 8 MCM training missions would be conducted annually in the EGTTR during the 2023–2030 period. Each mission would involve 4 underwater detonations of charges hand placed adjacent to inert mines, for a total of 32 annual detonations. The MCM neutralization charges consist of C-4 explosives, detonation cord, non-electric blasting caps, time fuzes, and fuze igniters; each charge has a NEW of approximately 20 lb. (9.07 kg). During each mission, with a maximum of 4 charges, would detonate with a delay no greater than 20 minutes between shots. After the final detonation, or a delay greater than 20 minutes, a 30-minute environmental observation would be conducted. Additionally, NAVSCOLEOD plans to conduct up to 80 floating mine training missions, which would involve detonations of charges on the water surface; these charges would have a NEW of approximately 5 lb (2.3 kg). All NAVSCOLEOD missions would occur only during daylight hours.

**Table 17—Planned Munitions for NAVSCOLEOD Training in the EGTTR**

Type	Category	Net Explosive Weight (lb)/(kg)	Detonation Scenario	Annual Quantity
Underwater Mine Charge	Charge	20 (9.1) <sup>a</sup>	Subsurface	32
Floating Mine Charge	Charge	5 (2.3) <sup>a</sup>	Surface	80

<sup>a</sup> Estimated

#### Description of Stressors

The USAF uses the EGTTR for training purposes and for testing of a variety of weapon systems described in this planned rule. All of the weapons systems considered likely to cause the take of marine mammals involve explosive detonations. Training and testing with these systems may introduce acoustic (sound) energy or shock waves from explosives into the environment. The following section describes explosives detonated at or just below the surface of the water within the EGTTR. Because of the complexity of

analyzing sound propagation in the ocean environment, the USAF relied on acoustic models in its environmental analyses and rulemaking/LOA application that considered sound source characteristics and conditions across the EGTTR.

Explosive detonations at the water surface send a shock wave and sound energy through the water and can release gaseous by-products, create an oscillating bubble, or cause a plume of water to shoot up from the water surface. When an air-to-surface munition impacts the water, some of the kinetic energy displaces water in the formation of an impact “crater” in the water, some of the kinetic energy is transmitted from the impact point as underwater acoustic energy in a pressure impulse, and the remaining kinetic energy is retained by the munition continuing to move through the water.

Following impact, the warhead of a live munition detonates at or slightly below the water surface. The warhead detonation converts explosive material into gas, further displacing water through the rapid creation of a gas bubble in the water, and creates a much larger pressure wave than the pressure wave created by the impact. These impulse pressure waves radiate from the impact point at the speed of sound in water, roughly 1,500 m per second. If the detonation is sufficiently deep, the gas bubble goes through a series of expansions and contractions, with each cycle being of successively lower energy. When detonations occur below but near the water surface, the initial gas bubble reaches the surface and causes venting, which also dissipates energy through the ejection of water and release of detonation gasses into the atmosphere. When a detonation occurs below the water surface after the impact crater has fully or partially closed, water can be violently ejected upward by the pressure impulse and through venting of the gas bubble formed by the detonation.

With radii of up to 15 m, the gas bubbles that would be generated by EGTTR munition detonations would be larger than the depth of detonation but much smaller than the water depth, so all munitions analyzed are considered to fully vent to the surface

without forming underwater bubble expansion and contraction cycles. When detonations occur at the water surface, a large portion of the energy and gasses that would otherwise form a detonation bubble are reflected upward from the water. Likewise, when a shallow detonation occurs below the water surface but prior to the impact crater closing, considerable energy is reflected upward from the water. As a conservative assumption, no energy losses from surface effects are included in the acoustic model.

The impulsive pressure waves generated by munition impact and warhead detonation radiate spherically and are reflected between the water surface and the sea bottom. There is generally some attenuation of the pressure waves by the sea bottom but relatively little attenuation of the pressure waves by the water surface. As a conservative assumption, the water surface is assumed to be flat (no waves) to allow for maximum reflectivity. Additionally, it is assumed that all detonations occur in the water and none of the detonations occur above the water surface when a munition impacts a target. This conservative assumption implies that all munition energy is imparted to the water rather than the intended targets. The potential impacts of exposure to explosive detonations are discussed in detail in the **Potential Effects of Specified Activities on Marine Mammals and their Habitat** section of the notice of proposed rulemaking published in the **Federal Register** (88 FR 8146; February 7, 2023).

### **Comments and Responses**

We published the proposed rule in the **Federal Register** on February 7, 2023 (88 FR 8146), with a 30-day comment period. With that proposed rule, we requested public input on our analyses, our preliminary findings, and the proposed regulations, and requested that interested persons submit relevant information and comments. During the 30-day comment period, we received 10 comment submissions: one from the Marine Mammal Commission (Commission) and nine from private citizens. NMFS has reviewed and considered all public comments received on the proposed rule and issuance of the

LOA. The private citizens' comments generally expressed disapproval of the action due to perceived potential impact to the Endangered Species Act (ESA)-listed Rice's whale. Our responses to all comments that are pertinent to this action are described below.

*Comment 1:* The Commission wrote that the proposed rule implied that behavioral takes were not estimated for exercises that included only one detonation per day. NMFS had noted that the potential for behavioral response from a single detonation was quantitatively accounted for by using the temporary threshold shift (TTS) threshold. Since the Commission believes that behavioral takes should be authorized for activities involving single detonations, it recommended that NMFS authorize the Level B harassment behavior takes of marine mammals, in addition to TTS takes, for mission-day categories J and K in the final rule or any LOA issued thereunder and ensure that the preamble to the final rule is clear regarding the fact that behavior takes were authorized for single-detonation missions.

*Response:* NMFS inadvertently conveyed in the proposed rule that the potential for behavioral response for single detonations was accounted for within the TTS thresholds/takes (5 dB sound exposure level (SEL) less than the TTS threshold), which is how NMFS typically recommends considering behavioral harassment from single detonations. However, the USAF computed behavioral threshold distances and takes for Missions J and K (both single detonation) using the underwater acoustic model. These model runs were done specifically to estimate behavioral effects, just like other model runs were done to estimate SEL-based TTS and PTS. Behavioral takes were actually estimated based on the species density within the area exposed to sound levels from 170 dB SEL to 165 dB SEL, where 170 dB SEL represents the TTS threshold. This language has been revised and clarified in the preamble to this final rule. As a general matter, NMFS continues to find that take by behavioral harassment from single explosive detonations is unlikely to result from exposures below the TTS threshold; however, at

Eglin Air Force Base's request, we have authorized these takes to provide coverage in the unlikely event they should occur.

*Comment 2:* The Commission notes that to minimize impacts on Rice's whales, NMFS has prohibited the use of live-fire munitions between the 100- and 400-m isobaths in the existing and new live impact areas (LIAs) and seaward of the setbacks from the 100-m isobath. The Commission recommended that NMFS prohibit use of live-fire munitions in the existing and new LIAs both within the core distribution area (CDA) and seaward of the setbacks from shallowest depths of the CDA.

*Response:* Within the LIAs, the CDA boundaries are comprised of straight lines that generally track along the 100-meter isobath boundary. The isobath is not a straight line but meanders back and forth across the CDA boundary. In some areas, the CDA boundary traverses areas of less depth than the 100-m isobath. Rice's whale densities are extremely low at the 100-meter isobath boundary and would be statistically meaningless in shallower waters (also no Rice's whale or other baleanopterid has been sighted by NMFS' aerial surveys in waters less than 100-m depth in this area, despite extensive coverage out to the 200-m isobath). The setbacks from the 100-meter isobath range from 7.323 km (mission-day A) to 0.368 km (mission-day R) landward. In some portions of both LIAs, the shallowest boundary of the CDA covers an area that is greater than the given setback distance landward of the 100-meter isobath. Therefore, using the CDA boundary would result in additional loss of LIA area for USAF, based on the CDA boundary itself, which is landward of some of the current setbacks and based on any new setbacks from the CDA boundary, most of which would be greater than the current setbacks. Currently, there are no other suitable locations to conduct live missions in the EGTTR outside the existing LIA and proposed East LIA. USAF has given up significant amounts of area within each LIA to reduce potential Level B harassment to the Rice's whale to the lowest levels practicable. These setbacks impact all USAF EGTTR missions.

Any additional loss of LIA would not be practicable as it would have a negative disproportionate impact on the ability of the USAF to conduct missions and on national security preparedness. Further, as indicated, such an additional setback would provide little, if any, additional reduction of impacts to Rice's whales and, accordingly, NMFS has not included this recommendation.

*Comment 3:* The Commission does not believe that the USAF would be able to visually monitor effectively for marine mammals entering the mortality and injury zones, particularly during the time between when the smaller mission area has been cleared during pre-mission surveys with vessels exiting beyond the larger human safety zone (up to 13 nmi/24 km) and the time of detonation(s) which would be a minimum of 30 minutes. The Commission also notes that the USAF video cameras available to assist with visual monitoring are not always used or operational when intended to be used. The Commission also noted that due to high altitudes of aircraft used during aerial surveillance, effective monitoring is not possible.

*Response:* NMFS disagrees with the Commission's assertions for several reasons. The 24 km (12.9 nmi) distance is for the largest, and less frequent, net-explosive weight (NEW) mission days when the detonation would be 945 lbs. This would occur on a maximum of 10 days per year. The Commission fails to note that the number of vessels employed would be proportionate to the size of the NEW used on a given mission. Up to 25 vessels would be used on days when the largest NEWs are planned. Further, the vessels will continue to monitor for marine mammals in or approaching the smaller mitigation zone both as they move outward towards the human safety zone, and from the edge of the human safety zone – if the mission area/mitigation zone is clear when they move out to the human safety zone, it is unlikely that a marine mammal would pass by the monitors to the inner mitigation zone in the next 30 minutes without being seen.

NMFS notes that video cameras are planned/required for use in all regular situations, and might not be used in situations of unplanned circumstances, such as in cases of equipment malfunction. In such situations, the test engineer and other staff can make a decision to delay, cancel, or postpone a mission due to asset status (*i.e.*, if video cameras are also unavailable or malfunctioning).

Regarding the effectiveness of aerial monitoring, NMFS notes that the electro-optical sensors employed by the USAF were specifically designed to detect targets on the electromagnetic spectrum under such areal and altitudinal parameters. NMFS is confident in the USAF's ability to effectively monitor for marine mammals from aircraft and marine vessels.

*Comment 4:* The Commission has previously recommended that the USAF's mitigation measures be supplemented with passive acoustic monitoring (PAM). As part of the previous 2018 rulemaking and issued LOA, NMFS required the USAF to: (1) conduct a PAM study as an initial step toward understanding acoustic impacts of underwater detonations, if funding was approved, and (2) conduct a follow-up PAM study to investigate marine mammal vocalizations before, during and after live missions in the EGTTT. The Commission recommended as part of this final rule that NMFS require the USAF to prioritize (1) completing both aspects of its PAM study and (2) further investigate ways to supplement its mitigation measures with the use of real-time PAM devices (*i.e.*, sonobuoys or hydrophones) in any final rule issued, similar to the previous final rule.

*Response:* The USAF conducted a single PAM study (Leidos 2020) on underwater detonations which was the first of the two-part condition of the 2018-2023 LOA. The study determined that inert underwater detonations were generally louder than expected. As a result of these findings, the USAF included analyses of impacts of inert

munitions in the LOA application and NMFS is requiring appropriate mitigation measures for inert munitions.

As of this writing, funding has been requested from near-term funding sources but has not yet been approved by the USAF for the second part of the study, which was to follow up on the results of the initial PAM study. NMFS and the USAF have reviewed the findings from the initial study and will discuss specific next steps. Furthermore, NMFS has included language in this final rule and the LOA requiring the USAF to prioritize studies to (1) follow up on the results of the initial PAM study by investigating marine mammal vocalizations before, during, and after live missions in the EGTTT, pending the availability of funding; and (2) investigate ways to supplement its mitigation measures with the use of real-time PAM devices, pending the availability of funding.

The Commission recommended that NMFS and the USAF investigate the possible use of sonobuoys for the second part of the study. NMFS and the USAF appreciate the Commission's recommendations regarding possible use of various types of sonobuoys.

*Comment 5:* The Commission recommended that NMFS require the USAF to implement mitigation measures for SINKEX activities that are similar to those required by NMFS for incidental take regulations for the U.S. Navy.

*Response:* Below, NMFS addresses each of the specific mitigation measures recommended by the Commission (*i.e.*, mitigation measures for SINKEX activities that are similar to those required by NMFS for U.S. Navy incidental take regulations).

1) The Commission recommended that the USAF establish two platforms (aerial and vessel) for conducting visual monitoring of a 4.6-km mitigation zone from 90 minutes before the first firing.

NMFS will require all range clearing vessels to be on site 90 minutes before the mission to clear the prescribed human safety zone and survey the mitigation zone for the

given mission-day category. Up to 25 vessels will be used depending upon the size of the NEW. Not all of these vessels will contain PSOs, but these will also be looking for marine mammals in addition to range-clearing exercises. PSOs will be stationed on all vessels that are required to monitor the mitigation zones for the given mission-day category for a minimum of 30 minutes or until the entirety of the mitigation zone has been surveyed, whichever takes longer. Furthermore, all mission-day categories require aerial-based monitoring, assuming assets are available and when such monitoring does not interfere with testing and training parameters required by mission proponents.

While the aerial platforms may not always be onsite 90 minutes before the mission, the measures required in these regulations provide similar equivalent protection, as the entirety of the mitigation zone will have been monitored by PSOs on vessels and aircraft a short time before the mission commences.

2) The Commission recommended that the USAF should conduct both visual monitoring from a vessel and passive acoustic monitoring of the mitigation zone during the exercise.

Real-time visual monitoring from a vessel would pose a safety threat to both the PSO as well as crew of the vessel. All vessels must have exited the human safety zone prior to the commencement of SINKEX activities. The large size of the human safety zone means that extended distance from a vessel to the SINKEX target area would not allow for effective monitoring from a vessel. However, video-based monitoring will be employed during SINKEX missions, which provides real-time observation data for the mitigation zone.

NMFS has engaged in multiple discussions with the USAF about the implementation of PAM. However, human safety concerns and the inability to make mission go/no-go decisions in a timely manner are the most immediate obstacles for the USAF implementing PAM as part of the suite of mitigation measures during live weapon

missions in the EGTTR. For safety purposes during live air-to-surface missions in the EGTTR and during SINKEX exercises portions of the Gulf of Mexico are closed off to human activity. The human safety zone corresponds to the weapon safety footprint. The size of the closure area varies depending on the weapons being dropped, the type of aircraft being used, and the specific release parameters (direction, altitude, airspeed, etc.) requested by the mission group, but it always encompasses the area occupied by the instrumentation barge (GRATV). Typically, this footprint is where personnel are restricted to ranges between a 9-nautical mile (nmi) radius up to a 12-nmi radius around the GRATV from the target and the GRATV that is usually within hundreds of meters of the target. As part of PAM, biologists generally deploy an array of hydrophones, listen for vocalizations from a nearby boat, and use software to triangulate an animal's general location. The ability to execute this requires multiple hydrophones lined up in a carefully determined array or fence configuration with a trained biologist in close proximity to the hydrophones. Alternatively, the biologist could be stationed in a remote location but would require a direct line-of-sight for radio links to transmit the data from the hydrophones. The maximum distance that a remote link could be established is estimated to be about 5 nmi. This would fall inside the human safety zone. Therefore, real-time monitoring for marine mammal vocalizations during a SINKEX mission is not considered feasible for human safety concerns.

The USAF is supportive of PAM and has conducted a NMFS-approved PAM study in 2020 to increase our understanding of acoustic impacts associated with underwater detonations. Given the need for additional research as recommended by the Commission, additional studies have been established as conditions of these regulations and LOA. Development, testing and full implementation of a real-time PAM system is not likely feasible during the effective period of the new LOA due to human safety concerns and the need for additional investigations of efficacious protocols. Considering

all of this, the use of PAM as a real-time mitigation measure is not practicable at this time.

3) The Commission recommended that the USAF observe marine mammals in the vicinity of where detonations occurred for 2 hr after sinking the vessel or until sunset (whichever comes first).

The post-mission survey area will be the area covered in 30 minutes of observation by both aerial crews and vessels in a direction down-current from the impact site or the actual pre-mission survey area, whichever is reached first. PSOs must survey the mission site for any dead or injured marine mammals. Additionally, post-mission cleanup operations will recover as much target-related debris as possible from the water surface by hand and by using dip nets. The USAF reports that typical post-cleanup operations involve the use of up to 10 vessels for up to 2 to 3 hours depending on the size of the NEW, and personnel on these vessels will be instructed to report any dead or injured marine mammals to the Lead Biologist. NMFS is not requiring a minimum time limit or specifying the number of vessels that must be employed post mission since it is difficult, if not impossible, to predict how much debris will occur at or near a given SINKEX mission location. Furthermore, it is inefficient and costly to require multiple vessels primarily engaged in cleanup activities to continue monitoring for extended periods after cleanup is complete. For single-detonation SINKEX actions, the USAF has committed to survey the entirety of the mission area or survey for 30 minutes, whichever comes first.

4) The Commission recommended that any additional platforms supporting the primary mission activity (e.g., providing range clearance) must assist in visual observation of the area where detonations occurred.

As noted above, up to 10 USAF support vessels primarily focused on collecting debris will spend several hours in the mission area collecting debris from damaged

targets. All vessels will be instructed to report any dead or injured marine mammals to the Lead Biologist.

In summary, with the exception of PAM, which NMFS concurs with the USAF is not practicable at this time, the USAF's required mitigation and monitoring measures are either similar to those employed by the Navy or provide comparable protection. Further, as noted, a requirement to investigate ways to supplement the USAF's mitigation measures with the use of real-time PAM devices has been included in these regulations. Monitoring reports under the LOA effective from 2018 through 2021 have not recorded take of any marine mammals. Only bottlenose dolphins have been observed and there have not been sightings of whales of any species. Based on the information above, NMFS has determined that the mandated mitigation and monitoring measures required for SINKEX activities in the EGTTR effect the least practicable adverse impact on the affected species and their habitat. Therefore, NMFS is not adopting the Commission's recommendation that the USAF measures be changed to mirror the Navy's protocols.

*Comment 6:* Several commenters wrote that the USAF should not be permitted to take marine mammals in the EGTTR since they are protected by the Marine Mammal Protection act and the Endangered Species Act; therefore, all activities that may harm the species are required to be banned.

*Response:* Both the MMPA and the ESA allow for the take of marine mammals or ESA-listed species, respectively, provided certain findings are made. Further, the MMPA states that NMFS "shall issue" incidental take authorizations provided the necessary findings are made. As described in this final rule, NMFS' analysis supports our determination that the authorized takes will have a negligible impact on the affected species or stocks. Further, we have included required mitigation measures that ensure that the testing and training activities in the EGTTR will have the least practicable adverse impact on affected marine mammal species or stocks.

*Comment 7:* One commenter wrote that the activities proposed by the USAF in the EGTTTR would exacerbate threats to the Rice's whale, leading the species to its eventual demise. Therefore, NMFS is unable to make a negligible impact determination regarding the species. As such, the requested incidental take should not be authorized. A separate commenter wrote that changes in marine mammal behavior have been found to directly impact health, including immunological changes in marine mammals, making individuals more susceptible to infection and making populations more susceptible to disease exposure. The commenter stated that this level of impact could have serious repercussions for the species as a whole and cannot be considered negligible.

*Response:* There is no evidence to support the statement that the USAF's planned activities in the EGTTTR would lead to the extinction of the species. As indicated in our analysis and by the authorization of a low number of takes by Level B harassment (no more than 6 in any year), NMFS acknowledges that some level of impact, in the form of behavioral disturbance, is likely to occur in the Rice's whale. However, as required to allow for incidental take, we further determined that such impacts resulting from the specified activity are not reasonably expected to, or not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (i.e. population-level effects). As discussed in the proposed rule and this final rule, NMFS made a negligible impact determination. Since NMFS did arrive at a negligible impact determination and satisfied the MMPA requirements, there are no legal grounds for prohibiting authorized take.

*Comment 8:* One commenter wrote that testing explosives in the EGTTTR could affect marine mammals even if they are not present since sources of food could be disturbed for the mammals, changing their hunting patterns, and disrupting the ecosystem.

*Response:* The **Potential Effects of Specified Activities on Marine Mammals and Their Habitat** section of the proposed rule (88 FR 8146, February 7, 2023) described the potential impacts of EGTTR activities on marine mammal habitat and prey sources. NMFS acknowledges that explosive detonations can impact both fish and invertebrate prey sources in manners ranging from behavioral disturbance to mortality for animals that are very close to the source. However, as described in the analysis, these impacts are expected to be short term and localized, and would be inconsequential to the fish and invertebrate populations, and to the marine mammals that use them as prey.

*Comment 9:* One commenter mistakenly wrote that the USAF anticipated take resulting from Level A and Level B harassment of Rice's whales with authorized Level A harassment of 2 Rice's whale, permanent threshold shifts (PTS) of 4 individuals, temporary threshold shifts (TTS) of 14 individuals, and behavior disturbance of 28 individuals over the 7-year analysis period (NMFS 2023). The commenter further suggested that since the species abundance is 51 individuals, the anticipated take numbers are proportionally significant, particularly when it comes to behavioral impacts, which are anticipated to affect the majority of the population (56 percent) over a seven-year period.

*Response:* The commenter is incorrect regarding the number of PTS and TTS takes. NMFS has authorized 6 takes by Level B harassment per year (2 by TTS and 4 behavioral harassment). NMFS does not expect and has not authorized take of Rice's whale by Level A harassment.

Further, if one assumes that each of the 6 annual exposures is incurred by a different whale, these authorized takes affect 11.8 percent (6/51) of the population during any given year. Importantly, each of those instances of take represents exposure within 1 day of the year. This represents low magnitude, short duration impacts to a relatively small portion of the total population.

*Comment 10:* One commenter wrote that the Rice's whale is highly sensitive to any anthropogenic forces and, therefore, authorization of the proposed activities would result in significant impacts and violate section 101 of the MMPA. They wrote that it was time for NMFS to fulfill their duty to conserve and protect this important marine resource by denying the USAF's request to take Rice's whales. Another commenter asked if it is necessary to test these weapons in the water. They stated that this represents a risk to ocean life and that there should be other options for locations to test military weapons. Another commenter asked why these military testing activities must take place where species stocks are struggling.

*Response:* NMFS acknowledges the comments and refers back to the response to comment 6 above. Assuming that the requirements of the MMPA are met, *e.g.*, findings of negligible impact and least practicable adverse impact, NMFS does not have discretion as to whether it may issue incidental take regulations (ITRs) and LOAs under those ITRs and shall prescribe mitigation measures that ensure the least practicable adverse impact on marine mammals and their habitat as defined in the military readiness provisions of the MMPA.

*Comment 11:* A commenter noted that the USAF entirely ignores potential impacts resulting from increased vessel traffic in Rice's whale habitat. The LOA Request details that EGTTR missions require up to 25 mission-support boats to establish a "safety zone" prior to and throughout the missions; as well as vessels for post-mission surveys and debris cleanup. For an endangered marine mammal whose primary habitat is already overlapping with high-traffic channels, the commenter wrote that recognition of the potential for vessel strikes is warranted.

*Response:* NMFS has considered the number of vessels involved in the activity and the potential for vessel strike. The number of USAF vessels required for any given mission day category will vary depending on the mission-day category and the size of the

NEW. The use of 25 vessels would occur infrequently when explosives with the largest NEWs would be deployed, and their entire purpose would be to detect and minimize impacts to marine mammals. Furthermore, all USAF vessels must adhere to required vessel strike avoidance measures that are expected to avoid strikes of marine mammals. Specifically, measures require vessels to stay 500 m away from any sighted Rice's whale. If a baleen whale cannot be positively identified to species level then it must be assumed to be a Rice's whale and 500 m separation distance must be maintained. Additionally, vessels must avoid transit in the Rice's whale CDA and within the 100 - 400 m isobath zone outside the CDA. If transit in these areas is unavoidable, vessels must not exceed 10 knots and transit at night is prohibited. The LIAs themselves overlay only a portion of the Rice's whale CDA.

No Air Force vessels have ever struck a whale in the EGTTR. Given the required vessel strike avoidance measures, the infrequency of vessel strikes more broadly, and the comparatively low numbers of vessels used in EGTTR activities, the potential for strike by a USAF vessel of any marine mammal is considered so low as to be discountable, and this is especially true for the Rice's whale, given their low density. NMFS does not anticipate, and has not authorized, vessel strike of Rice's whales or any other marine mammal.

*Comment 12:* A commenter stated that the proposed regulation fails to provide for long-term environmental monitoring plans, and cleanup initiatives, in response to the contamination associated with the disposal of ordnance and target vessels in the sea. The commenter urged NMFS to expand the proposed rule to include such items. They referred to the Military Munitions Response Program, which addresses munitions-related concerns, such as environmental and health hazards from releases of unexploded ordnance (UXO) and discarded military munitions (DDM), and prioritizes sites for cleanup based on risks to the environment.

*Response:* There is no evidence that USAF activities in the EGTTR result in contamination from UXOs, target vessels or any other mission-related activities. USAF post-mission cleanup procedures minimize the amount of mission-related debris that remains on the water surface and in the water column. Post-mission cleanup crews recover as much target-related debris as possible from the water surface by hand and by using dip nets; typical post-cleanup operations involve the use of several boats for up to 2 to 3 hours. Target-related debris that is not recovered by cleanup crews is dispersed by ocean currents, and much of it is expected to eventually settle on the seafloor. Based on the amount of target-related debris that would be deposited into the marine environment, post-mission cleanup of the debris, and dispersion of the unrecoverable debris by ocean currents, we conclude that any associated impacts on marine mammal habitat would be minimal.

After being deposited on the seafloor, debris items may become partially or entirely buried in sediments over time, depending on the item's size, shape, and density, and environmental factors such as sediment characteristics, water depth, and the occurrence of strong storms that may move sediments. Munitions that become buried deep in sediments may experience less corrosion because of low oxygen levels and may remain intact for longer periods of time. Inert munitions and UXO that settle on the seafloor would displace the habitat provided by the affected sediments to benthic epifauna and infauna but, like other sunken artificial structures, would also provide substrate that could be used as habitat by marine organisms. The overall level of disturbance to marine sediments in the EGTTR from mission-related debris is expected to be minor based on the quantity of debris that would be deposited on the seafloor and the expected behavior of the debris in the marine environment over time. Based on the analysis conducted in the current EGTTR Range Environmental Assessment (REA) regarding metals, explosives, and other materials associated with EGTTR operations,

USAF activities would have been unlikely to adversely impact water or sediment quality. The analyses of these potential impacts are discussed in detail in the current EGTTT REA (USAF 2022).

The MMPA requires that NMFS include marine mammal monitoring and reporting measures that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present while conducting the activities. Monitoring for EGTTT activities is described in the Monitoring section and requires PSOs to provide description of observed behaviors (in both the presence and absence of test activities), which will help us better understand the impacts of EGTTT activities on marine mammals. There are no MMPA requirements regarding wide-spread environmental or ecological monitoring beyond what has just been described. Long-term environmental monitoring and additional cleanup initiatives are beyond the scope of this action.

*Comment 13:* One commenter was concerned that explosives compounds containing carcinogens and toxins can accumulate in coastal environments and marine organisms, which can cause sub-lethal genetic and metabolic effects. Furthermore, there is also a risk that chemical agents will be spread through the food chain.

*Response:* See the response to comment 12 above.

*Comment 14:* The commenter wrote that no critical habitat has been designated for the Rice's whale as is required under the Endangered Species Act. Therefore, NMFS should make designating critical habitat for Rice's whales a priority before approving authorizations for the USAF to participate in military activities that threaten the species' survival.

*Response:* Critical habitat is defined as habitat needed to support recovery of species listed under the Endangered Species Act and NMFS Fisheries is required to determine whether there are areas that meet the definition of critical habitat. Currently,

NMFS is working on an ESA rulemaking to propose designation of critical habitat for the Rice's whale which contains: (1) the biological information used to determine the specific areas containing the features essential to the conservation of the species requiring special management, and (2) consideration of the national security, economic, and other relevant impacts of designating critical habitat.

The designation of critical habitat for an ESA-listed species, in this case the Rice's whale, is a separate action and not a prerequisite to fulfilling our statutory mandate under section 101(a)(5)(A) of the MMPA.

### **Changes from the Proposed Rule to the Final Rule**

This final rule includes no substantive changes from the proposed rule. Minor typographical errors were included in several tables in the proposed rule (i.e. Tables 25, 36, and 37 in the preamble and Table 1 in the regulatory text). The values have been corrected in this final rule. The exposure analysis and take estimations in the proposed rule were based on the correct numbers so were not affected by this typographical error. They remain unchanged as part of this final rule.

The preamble text in the Pre-Mission Surveys section and § 218.64(a)(1)(iii) in the proposed rule stated that “For all live missions except gunnery missions, USAF PSOs must monitor the mitigation zones as defined in Table 2 for the given mission-day category for a minimum of 30 minutes or until the entirety of the mitigation zone has been surveyed, whichever comes first.” This has been revised in the final rule to read “...for a minimum of 30 minutes or until the entirety of the mitigation zone has been surveyed, whichever takes longer.” NMFS and the USAF believe that this revision ensures that the entirety of all of the mitigation zones will be monitored. NMFS revised the language in the preamble pertaining to behavioral harassment thresholds for single detonations as explained in the response to Comment 1. Finally, NMFS will require the USAF to conduct two passive acoustic monitoring (PAM) studies, pending approval of

funding. These studies are described in the response to comment 4 and have been included in the regulatory text in a new paragraph (f) on acoustic monitoring within § 218.65, entitled “Requirements for monitoring and reporting”.

### **Description of Marine Mammals in the Area of the Specified Activities**

Marine mammal species and their associated stocks that have the potential to occur in the project are presented in Table 18. The USAF anticipates the take of individuals of three marine mammal species by Level B harassment and two of those species by Level A harassment. The USAF does not request authorization for any serious injuries or mortalities of marine mammals, and NMFS agrees that serious injury and mortality is unlikely to occur from the USAF’s activities.

The proposed rule included additional information about the species in this rule, all of which remains valid and applicable but has not been reprinted in this final rule, including a subsection entitled *Marine Mammal Hearing* that described the importance of sound to marine mammals and characterized the different groups of marine mammals based on their hearing sensitivity. Therefore, we refer the reader to our **Federal Register** notice of proposed rulemaking (88 FR 8146; February 7, 2023) for more information.

Information on the status, distribution, abundance, population trends, habitat, and ecology of marine mammals in the EGTTR may be found in Chapter 4 of the USAF’s rulemaking/LOA application. NMFS reviewed this information and found it to be accurate and complete. All stocks managed under the MMPA in this region are assessed in NMFS’ 2021 U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment (Hayes *et al.* 2022; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>). All values presented in Table 18 are the most recent available at the time of publication and are available online at: [www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments](https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments).

**Table 18—Marine Mammals Potentially Present in the Specified Geographical Region**

Common name	Scientific name	Stock	ESA/MMP A status; Strategic (Y/N) <sup>1</sup>	NMFS stock abundance (CV, N <sub>min</sub> , most recent abundance survey) <sup>2</sup>	Potential biological removal (PBR)	Annual M/SI <sup>3</sup>
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Balaenopteridae (rorquals)						
Rice's whale <sup>4</sup>	<i>Balaenoptera ricei</i>	Gulf of Mexico (GOM)	E/D; Y	51 (0.50; 34; 2017-18)	0.1	0.5
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Common bottlenose dolphin	<i>Tursiops 36runcates truncatus</i>	Northern GOM Continental Shelf	-; N	63,280 (0.11; 57,917; 2018)	556	65
Atlantic spotted dolphin	<i>Stenella frontalis</i>	GOM	-; N	21,506 (0.26; 17,339; 2017-18)	166	36

<sup>1</sup>ESA status: Endangered /MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

<sup>2</sup>NMFS marine mammal stock assessment reports online at: [www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments](http://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments). CV is coefficient of variation; N<sub>min</sub> is the minimum estimate of stock abundance.

<sup>3</sup>These values, found in NMFS' Stock Assessment Reports (SARs), represent annual levels of human-caused mortality (M) plus serious injury (SI) from all sources combined (e.g., commercial fisheries, ship strike). These values are generally considered minimums because, among other reasons, not all fisheries that could interact with a particular stock are observed and/or observer coverage is very low, and, for some stocks (such as the Atlantic spotted dolphin and continental shelf stock of bottlenose dolphin), no estimate for injury due to the *Deepwater Horizon* oil spill has been included. See SARs for further discussion.

<sup>4</sup>The 2021 final rule refers to the Gulf of Mexico (GOM) Bryde's whale (*Balaenoptera edeni*). These whales were subsequently described as a new species, Rice's whale (*Balaenoptera ricei*) (Rosel *et al.*, 2021).

Below, we include additional information about the marine mammals in the area of the specified activities that informs our analysis, such as identifying known areas of important habitat or behaviors, or where Unusual Mortality Events (UME) have been designated.

#### *Rice's Whale*

The Gulf of Mexico Bryde's whale was listed as endangered throughout its entire range on April 15, 2019, under the Endangered Species Act (ESA). Based on genetic analyses and new morphological information NOAA Fisheries recently revised the common and scientific names to recognize this new species (*Balaenoptera ricei*) as being separate from other Bryde's whale populations (86 FR 47022; August 21, 2021). Rosel and Wilcox (2014) first identified a new, evolutionarily distinct lineage of whale in the

Gulf of Mexico. Genetic analysis of whales sampled in the northeastern Gulf of Mexico revealed that this population is evolutionarily distinct from all other whales within the Bryde's whale complex and all other known balaenopteridae species (Rosel and Wilcox 2014).

The Rice's whale is the only year-round resident baleen whale species in the Gulf of Mexico. Rosel *et al.* (2021) reported that based on a compilation of sighting and stranding data from 1992 to 2019, the primary habitat of the Rice's whale is the northeastern Gulf of Mexico, particularly the De Soto Canyon area, at water depths of 150 to 410 m.

Biologically Important Areas (BIAs) include areas of known importance for reproduction, feeding, or migration, or areas where small and resident populations are known to occur (Van Parijs, 2015). Unlike ESA critical habitat, these areas are not formally designated pursuant to any statute or law but are a compilation of the best available science intended to inform impact and mitigation analyses. In 2015, a year round small and resident population BIA for Bryde's whales (later designated as Rice's whales) was identified from the De Soto Canyon along the shelf break to the southeast (LaBrecque *et al.* 2015). The 23,559 km<sup>2</sup> BIA covers waters between 100 and 300 m deep from approximately south of Pensacola to approximately west of Fort Myers, FL (LaBrecque *et al.* 2015). The deepest location where a Rice's whale has been sighted is 408 m (Rosel *et al.* 2021). Habitat for the Rice's whale is currently considered by NMFS to be primarily within the depth range of 100 to 400 m in this part of the Gulf of Mexico (NMFS 2016, 2020a), and in 2019 NMFS delineated a Core Distribution Area (<https://www.fisheries.noaa.gov/resource/map/rices-whale-core-distribution-area-map-gis-data>) based on visual and tag data available through 2019. No critical habitat has yet been designated for the species, and no recovery plan has yet been developed.

*Unusual Mortality Events (UMEs)*

An UME is defined under section 410(6) of the MMPA as a stranding that is unexpected; it involves a significant die-off of any marine mammal population and demands immediate response. There are currently no UMEs with ongoing investigations in the EGTTT. There was a UME for bottlenose dolphins that was active beginning in February 2019 and closing in November of the same year that included the northern Gulf of Mexico. Dolphins developed lesions that were thought to be caused by exposure to low salinity water stemming from extreme freshwater discharge. This UME is closed.

### **Potential Effects of Specified Activities on Marine Mammals and their Habitat**

We provided a detailed discussion of the potential effects of the specified activities on marine mammals and their habitat in our **Federal Register** notice of proposed rulemaking (88 FR 8146; February 7, 2023). In the Potential Effects of Specified Activities on Marine Mammals and Their Habitat section of the proposed rule, NMFS provided a description of the ways marine mammals may be affected by these activities in the form of sensory impairment (permanent and temporary threshold shift and acoustic masking), physiological responses (particularly stress responses), behavioral disturbance, or habitat effects. All of this information remains valid and applicable. Therefore, we do not reprint the information here but refer the reader to that document.

Having considered the new information, along with information provided in public comments on the proposed rule, we have determined that there is no new information that substantively affects our analysis of potential impacts on marine mammals and their habitat that appeared in the proposed rule, all of which remains applicable and valid for our assessment of the effects of the USAF's activities during the seven-year period of this rule.

### **Estimated Take of Marine Mammals**

This section indicates the number of takes that NMFS is proposing to authorize, which is based on the maximum amount that is reasonably likely to occur, depending on

the type of take and the methods used to estimate it, as described in detail below. NMFS agrees that the methods the USAF has put forth described herein to estimate take (including the model, thresholds, and density estimates), and the resulting numbers estimated for authorization, are appropriate and based on the best available science.

All takes are by harassment. For a military readiness activity, the MMPA defines “harassment” as (i) Any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) Any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered (Level B harassment). No serious injury or mortality of marine mammals is expected to occur.

Authorized takes would primarily be in the form of Level B harassment, as use of the explosive sources may result, either directly or as result of TTS, in the disruption of natural behavioral patterns to a point where they are abandoned or significantly altered (as defined specifically at the beginning of this section, but referred to generally as behavioral disruption). There is also the potential for Level A harassment, in the form of auditory injury to result from exposure to the sound sources utilized in training and testing activities. As described in this **Estimated Take of Marine Mammals** section, no non-auditory injury is anticipated or authorized, nor is any serious injury or mortality.

Generally speaking, for acoustic impacts NMFS estimates the amount and type of harassment by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be taken by Level B harassment or incur some degree of temporary or permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day or event; (3) the density or occurrence of marine mammals within these ensonified areas; and (4) the number of days

of activities or events. This analysis of the potential impacts of the planned activities on marine mammals was conducted by using the spatial density models developed by NOAA's Southeast Fisheries Science Center for the species in the Gulf of Mexico (NOAA 2022). The density model integrated visual observations from aerial and shipboard surveys conducted in the Gulf of Mexico from 2003 to 2019.

The munitions planned to be used by each military unit were grouped into mission-day categories so the acoustic impact analysis could be based on the total number of detonations conducted during a given mission to account for the accumulated energy from multiple detonations over a 24-hour period. A total of 19 mission-day categories were developed for the munitions planned to be used. Using the dBSea underwater acoustic model and associated analyses, the threshold distances associated with Level A harassment (PTS) and Level B (TTS and behavioral) harassment zones were estimated for each mission-day category for each marine mammal species. Takes were estimated based on the area of the harassment zones, predicted animal density, and annual number of events for each mission-day category. To assess the potential impacts of inert munitions on marine mammals, the planned inert munitions were categorized into four classes based on their impact energies, and the threshold distances for each class were modeled and calculated as described for the mission-day categories.

#### *Acoustic Thresholds*

Using the best available science, NMFS has established acoustic thresholds that identify the most appropriate received level of underwater sound above which marine mammals exposed to these sound sources could be reasonably expected to directly experience a disruption in behavior patterns to a point where they are abandoned or significantly altered, to incur TTS (equated to Level B harassment), or to incur PTS of some degree (equated to Level A harassment). Thresholds have also been developed to identify the pressure levels above which animals may incur non-auditory injury from

exposure to pressure waves from explosive detonation. Refer to the Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) report (U.S. Department of the Navy 2017c) for detailed information on how the criteria and thresholds were derived.

#### Hearing Impairment (TTS/PTS), Tissues Damage, and Mortality

NMFS' Acoustic Technical Guidance (NMFS 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). The Acoustic Technical Guidance also identifies criteria to predict TTS, which is not considered injury and falls into the Level B harassment category. The USAF's planned activity only includes the use of impulsive (explosives) sources. These thresholds (Table 19) were developed by compiling and synthesizing the best available science and soliciting input multiple times from both the public and peer reviewers. The references, analysis, and methodology used in the development of the thresholds are described in Acoustic Technical Guidance, which may be accessed at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance>.

Additionally, based on the best available science, NMFS uses the acoustic and pressure thresholds indicated in Table 19 to predict the onset of TTS, PTS, tissue damage, and mortality for explosives (impulsive) and other impulsive sound sources.

**Table 19--Onset of TTS, PTS, Tissue Damage, and Mortality Thresholds for Marine Mammals for Explosives and Other Impulsive Sources**

Functional Hearing Group	Species	Onset TTS	Onset PTS	Mean Onset Slight Gastrointestinal (GI)	Mean Onset Slight Lung Injury	Mean Onset Mortality

				Tract Injury		
Low-frequency cetaceans	Rice’s whale	168 dB SEL (weighted ) or 213 dB Peak SPL	183 dB SEL (weighted ) or 219 dB Peak SPL	237 dB Peak SPL	Equation 1	Equation 2
Mid-frequency cetaceans	Dolphins	170 dB SEL (weighted ) or 224 dB Peak SPL	185 dB SEL (weighted ) or 230 dB Peak SPL	237 dB Peak SPL		
Notes:						
Equation 1: 47.5M <sup>1/3</sup> (1+[D <sub>Rm</sub> /10.1]) <sup>1/6</sup> Pa-sec	Equation 2: 103M <sup>1/3</sup> (1+[D <sub>Rm</sub> /10.1]) <sup>1/6</sup> Pa-sec	M = mass of the animals in kg  D <sub>Rm</sub> = depth of the receiver (animal) in meters  SPL = sound pressure level				

Refer to the Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) report (U.S. Department of the Navy, 2017c) for detailed information on how the criteria and thresholds were derived. Non-auditory injury (*i.e.*, other than PTS) and mortality are so unlikely as to be discountable under normal conditions and are therefore not considered further in this analysis.

#### Behavioral Disturbance

Though significantly driven by received level, the onset of Level B harassment by direct behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.*, frequency, predictability, duty

cycle, distance), the environment (*e.g.*, bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Ellison *et al.* 2011; Southall *et al.* 2007). Based on what the available science indicates and the practical need to use thresholds based on a factor or factors that are both predictable and measurable for most activities, NMFS uses generalized acoustic thresholds based primarily on received level (and distance in some cases) to estimate the onset of Level B harassment by behavioral disturbance.

*Explosives* - Explosive thresholds for Level B harassment by behavioral disturbance for marine mammals are the hearing groups' TTS thresholds minus 5 dB (see Table 20 below for the TTS thresholds for explosives) for events that contain multiple impulses from explosives underwater. See the Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) report (U.S. Department of the Navy 2017c) for detailed information on how the criteria and thresholds were derived. NMFS continues to concur that this approach represents the best available science for determining behavioral disturbance of marine mammals from multiple explosives. While marine mammals may also respond to single explosive detonations, these responses are expected to more typically be in the form of startle reaction, rather than a disruption in natural behavioral patterns to the point where they are abandoned or significantly altered. On the rare occasion that a single detonation might result in a more severe behavioral response that qualifies as Level B harassment, it would be expected to be in response to a comparatively higher received level. Accordingly, NMFS considers the potential for these responses to be quantitatively accounted for through the application of the TTS threshold, which, as noted above, is 5 dB higher than the behavioral harassment threshold for multiple explosives. However, the USAF computed behavioral threshold distance and takes for Missions J and K, which are single detonation mission day categories, by using the underwater acoustic model. These model runs were done specifically to estimate

behavioral effects (just like other model runs were done to estimate SEL-based TTS and PTS). Behavioral takes were estimated based on the species density within the area exposed to sound levels from 170 dB to 165 dB, where 170 dB SEL is the threshold for TTS. While NMFS considers behavioral harassment at these lower levels unlikely, we have analyzed and authorized these lower-level takes as requested by the USAF to provide coverage in the unlikely event they should occur.

**Table 20--Thresholds for Level B Harassment by Behavioral Disturbance for Explosives for Marine Mammals**

Medium	Functional Hearing Group	SEL (weighted)
Underwater	LF	163
Underwater	MF	165

Note: Weighted SEL thresholds in dB re 1  $\mu\text{Pa}^2\text{s}$  underwater. LF = low-frequency, MF = mid-frequency, HF = high-frequency.

#### *USAF's Acoustic Effects Model*

The USAF's Acoustic Effects Model calculates sound energy propagation from explosives during USAF activities in the EGTTT. The net explosive weight (NEW) of a munition at impact can be directly correlated with the energy in the impulsive pressure wave generated by the warhead detonation. The NEWs of munitions addressed as part of this final rule range from 0.1 lb (0.04 kg) for small projectiles to 945 lb (428.5kg) for the largest bombs. The explosive materials used in these munitions also vary considerably with different formulations used to produce different intended effects. The primary detonation metrics directly considered and used for modeling analysis are the peak impulse pressure and duration of the impulse. An integration of the pressure of an impulse over the duration (time) of an impulse provides a measure of the energy in an impulse. Some of the NEWs of certain types of munitions, such as missiles, are

associated with the propellant used for the flight of the munition. This propellant NEW is unrelated to the NEW of the warhead, which is the primary source of explosive energy in most munitions. The propellant of a missile fuels the flight phase and is mostly consumed prior to impact. Missile propellant typically has a lower flame speed than warhead explosives and is relatively insensitive to detonation from impacts but burns readily. A warhead detonation provides a high-pressure, high-velocity flame front that may cause burning propellant to detonate; therefore, this analysis assumes that the unconsumed residual propellant that remains at impact contributes to the detonation-induced pressure impulse in the water. The impact analysis assumes that 20 percent of the propellant remains unconsumed in missiles at impact; this assumption is based on input from user groups and is considered a reasonable estimate for the purpose of analysis. The NEW associated with this unconsumed propellant is added to the NEW of the warhead to derive the total energy released by the detonation. Absent a warhead detonation, it is assumed that continued burning or deflagration of unconsumed residual propellant does not contribute to the pressure impulse in the water; this applies to inert missiles that lack a warhead but contain propellant for flight.

In addition to the energy associated with the detonation, energy is also released by the physical impact of the munition with the water. This kinetic energy has been calculated and incorporated into the estimations of munitions energy for both live and inert munitions in this final rule. The kinetic energy of the munition at impact is calculated as one half of the munition mass times the square of the munition velocity. The initial impact event contributing to the pressure impulse in water is assumed to be 1 millisecond in duration. To calculate the velocity (and kinetic energy) immediately after impact, the deceleration contributing to the pressure impulse in the water is assumed for all munitions to be 1,500 g-forces, or 48,300 feet per square second over 1 millisecond. A substantial portion of the change in kinetic energy at impact is dissipated as a pressure

impulse in the water, with the remainder being dissipated through structural deformation of the munition, heat, displacement of water, and other smaller energy categories. Even with 1,500 g-forces of deceleration, the change in velocity over this short time period is small and is proportional to the impact velocity and munition mass. The impact energy is the portion of the kinetic energy at impact that is transmitted as an underwater pressure impulse, expressed in units of trinitrotoluene-equivalent (TNTEq). The impact energies of the planned live munitions were calculated and included in their total energy estimations. The impact energies of the inert munitions planned to be used were also calculated. To assess the potential impacts of inert munitions on marine animals, the inert munitions were categorized based on their impact energies into the following four classes of 2 lb (0.9 kg), 1 lb (0.45 kg), 0.5 lb (0.22 kg), and 0.15 lb (0.07 kg) TNTEq; these values correspond closely to the actual or average impact energy values of the munitions and are rounded for the purpose of analysis. The 2 lb class represents the largest inert bomb, whereas the 1 lb class represents the largest inert missile. The inert missile has greater mass but lower impact energy than the bomb; this is because the bomb's lower velocity at impact and associated change in velocity over the deceleration period, which contributes to the pressure impulse. The 0.5 lb and 0.15 lb impact energy classes each represent the approximate average impact energy of multiple munitions, with the 0.5 lb class representing munitions with mid-level energies, and the 0.15 lb class representing munitions with the lowest energies (Table 21).

**Table 21. Impact Energy Classes for Inert Munitions**

Impact Energy Class (lb TNTEq)/(kg)	Approximate Weight (lb)/(kg)	Approximate Velocity (Mach)
2 (0.9)	2,000 (907)	1.1
1 (0.45)	2,250 (1020.3)	0.9
0.5 (0.22)	250 to 650 (113.4 to 294.8)	Variable

0.15 (0.07)	1 to 285 (0.5 to 129.2)	Variable
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The NEW associated with the physical impact of each munition and the unconsumed propellant in certain munitions is added to the NEW of the warhead to derive the NEW at impact (NEW<sub>i</sub>) for each live munition. The NEW<sub>i</sub> of each munition was then used to calculate the peak pressure and pressure decay for each munition. This results in a more accurate estimate of the actual energy released by each detonation. Extensive research since the 1940s has shown that each explosive formulation produces unique correlations to explosive performance metrics. The peak pressure and pressure decay constant depend on the NEW, explosive formulation, and distance from the detonation. The peak pressure and duration of the impulse for each munition can be calculated empirically using similitude equations, with constants used in these equations determined from experimental data (Naval Surface Warfare Center (NSWC) 2017). The explosive-specific similitude constants and munition-specific NEW<sub>i</sub> were used for calculating the peak pressure and pressure decay for each munition analyzed. It should be noted that this analysis assumes that all detonations occur in the water and none of the detonations occur above the water surface when a munition impacts a target. This exceptionally conservative assumption implies that all munition energy is imparted to the water rather than the intended targets. See Appendix A in the LOA application for detailed explanations of similitude equations.

The following standard metrics are used to assess underwater pressure and impulsive noise impacts on marine animals:

- SPL: The SPL for a given munition can be explicitly calculated at a radial distance using the similitude equations.
- SEL: A commercially available software package, dBSea (version 2.3), was used to calculate the SEL for each mission day.

- **Positive Impulse:** This is the time integral of the initial positive phase of the pressure impulse. This metric provides a measure of energy in the form of time-integrated pressure. Units are typically pascal- seconds ( $\text{Pa}\cdot\text{s}$ ) or pounds per square inch (psi) per millisecond (msec) ( $\text{psi}\cdot\text{msec}$ ). The positive impulse for a given munition can be explicitly calculated at a given distance using the similitude equations and integrating the pressure over the initial positive phase of the pressure impulse.

The munition-specific peak pressure and pressure decay at various radii were used to determine the species-specific distance to effect threshold for mortality, non-auditory injury, peak pressure-induced permanent threshold shift (PTS) in hearing and peak pressure-induced temporary threshold shift (TTS) in hearing for each species. The munition-specific peak pressures and decays for all munitions in each mission-day category were used as a time-series input in the dBSea underwater acoustic model to determine the distance to effect for cumulative SEL-based (24-hour) PTS, TTS, and behavioral effects for each species for each mission day.

The dBSea model was conducted using a constant sound speed profile (SSP) of 1500 m/s to be both representative of local conditions and to prevent thermocline induced refractions from distorting the analysis results. Salinity was assumed to be 35 parts per thousand (ppt) and pH was 8. The water surface was treated as smooth (no waves) to conservatively eliminate diffraction induced attenuation of sound. Currents and tidal flow were treated as zero. Energy expended on the target and/or on ejecting water or transfer into air was ignored and all weapon energy was treated as going into underwater acoustic energy to be conservative. Finally, the bottom was treated as sand with a sound speed of 1650 m/s and an attenuation of 0.8 dB/wavelength.

The harassment zone is the area or volume of ocean in which marine animals could be exposed to various pressure and impulsive noise levels generated by a surface or

subsurface detonation that would result in mortality; non-auditory injury and PTS (Level A harassment impacts); and TTS and behavioral impacts (Level B harassment impacts). The harassment zones for the planned detonations were estimated using Version 2.3 of the dBSea model for cumulative SEL and using explicit similitude equations for SPL and positive impulse. The characteristics of the impulse noise at the source were calculated based on munition-specific data including munition mass at impact, munition velocity at impact, NEW of warheads, explosive-specific similitude data, and propellant data for missiles. Table 22 presents the source-level SPLs (at  $r = 1$  meter) calculated for the planned munitions.

**Table 22--Calculated Source SPLs for Munitions**

Modeled Explosive	Model NEWi (lm)/(kg)	Peak Pressure and Decay Values		
		Pmax @ 1 m (psi)	SPL @ 1 m dB re 1 mPa	$\Theta$ msec
Tritonal	241.36 (109.5)	45961.4858	290.0	0.320
Tritonal	192.3 (87.2)	42101.8577	289.3	0.302
Comp B	98.3 (44.6)	37835.4932	288.3	0.200
PBXN-110	36.18 (13.4)	24704.864	284.6	0.167
PBXN-110	20 (9.1)	19617.2833	282.6	0.143
PBXN-110	13.08 (5.9)	16630.2435	281.2	0.128
PBXN-110	13.08 (5.9)	16630.2435	281.2	0.128
PBXN-9	13.08 (5.9)	17240.2131	281.5	0.124
Comp B	3.8 (1.7)	10187.8419	276.9	0.090
Comp B	4.72 (2.1)	11118.8384	277.7	0.095
Tritonal	36.1 (16.4)	22074.1015	283.7	0.198
Tritonal	36.1 (19.4)	22074.1015	283.7	0.198
PBXN-9	0.49 (0.2)	4757.6146	270.3	0.054
PBXN-9	0.44 (0.2)	4561.06062	270.0	0.053

Tritonal	192.3 (87.2)	42101.8577	289.3	0.302
H-6	100 (45.4)	38017.3815	288.4	0.237

$\theta$  = shock wave time constant; dB re 1  $\mu$ Pa = decibel(s) referenced to 1 micropascal; lb = pound(s); lbm = pound-mass; m = meter(s); mm = millimeter(s); msec = millisecond(s); NEWi = net explosive weight at impact; Pmax = shock wave peak pressure; psi = pound(s) per square inch; SPL = sound pressure level;

For SEL analysis, the dBSea model was used with the ray-tracing option for calculating the underwater transmission of impulsive noise sources represented in a time series (1,000,000 samples per second) as calculated using similitude equations ( $r = 1$  meter) for each munition for each mission day. All surface detonations are assumed to occur at a depth of 1 m, and all subsurface detonations, which would include largest bombs and subsurface mines, are assumed to occur at a depth of 3 m. The model used bathymetry for LIA with detonations occurring at the center of the LIA with a water depth of 70 m. The seafloor of the LIA is generally sandy, so sandy bottom characteristics for reflectivity and attenuation were used in the dBSea model, as previously described. The model was used to calculate impulsive acoustic noise transmission on one-third octaves from 31.5 hertz to 32 kilohertz. Maximum SELs from all depths projected to the surface were used for the analyses.

The cumulative SEL is based on multiple parameters including the acoustic characteristics of the detonation and sound propagation loss in the marine environment, which is influenced by a number of environmental factors including water depth and seafloor properties. Based on integration of these parameters, the dBSea model predicts the distances at which each marine animal species is estimated to experience SELs associated with the onset of PTS, TTS, and behavioral disturbance. As noted previously, thresholds for the onset of TTS and PTS used in the model and pressure calculations are based on those presented in Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) (Department of the Navy (DoN) 2017) for cetaceans with mid- to high-frequency hearing (dolphins) and low-frequency hearing

(Rice's whale). Behavioral thresholds are set 5 dB below the SEL-based TTS threshold.

Table 23 shows calculated SPLs and SELs for the designated mission-day categories.

**Table 23 --Calculated Source SPLs and SELs for Mission-Day Categories**

Mission Day	Total Warhead NEW, lbm <sup>a</sup> (kg)	Modeled NEW <sub>i</sub> , lbm/(kg)	Source Cumulative SEL, dB	Source Peak SPL, dB
A	2402.6 (108.6)	2413.6 (1094.6)	262.1	290
B	1961 (889.3)	2029.9 (920.6)	261.4	289.3
C	1145 (519.2)	1376.2 (624.1)	259.8	288.3
D	562 (254.8)	836.22 (379.2)	257.6	288.3
E	817.88 (370.9)	997.62 (452.0)	257.1	281.5
F	584 (264.8)	584.6 (265.1)	256.2	289.3
G	191(86.6)	191.6 (86.9)	250.4	277.7
H	60.5 (24.7)	61.1 (27.7)	245.2	268.8
I	18.4 (8.3)	30.4 (13.8)	242.5	276.9
J	945 (428.6)	946.8 (429.4)	258.1	294.6
K	Not available	350 (158.7)	253.4	291.5
L	624.52 (283.2)	627.12 (284.4)	256.2	290
M	324 (146.9)	324.9 (147.3)	253.2	283.6
N	219.92 (99.7)	238.08 (107.9)	252	285.3
O	72 (36.6)	104.64 (47.5)	248.3	281.2
P	90 (40.8)	130.8 (59.3)	249.3	281.2
Q	94 (42.6)	94.4 (42.8)	247.5	277.7
R	35.12 (15.9)	35.82 (16.2)	241.7	270.3
S	130 (58.9)	130 (58.9)	249.4	283

lbm=pound-mass

### *Mission-Day Categories*

The munitions planned to be used by each military unit were grouped into mission-day categories so the acoustic impact analysis could be based on the total number of detonations conducted during a given mission instead of each individual detonation. This analysis was done to account for the accumulated energy from multiple detonations over a 24-hour period.

The estimated number of mission days assigned to each category was based on historical numbers and projections provided by certain user groups. Although the mission-day categories may not represent the exact manner in which munitions would be used, they provide a conservative range of mission scenarios to account for accumulated energy from multiple detonations. It is important to note that only acoustic energy metrics (SEL) are affected by the accumulation of energy over a 24-hour period. Pressure metrics (*e.g.*, peak SPL and positive impulse) do not accumulate and are based on the highest impulse pressure value within the 24-hour period. Based on the categories developed, the total NEWi per mission day would range from 2,413.6 to 30.4 lb (1,094.6 to 13.8 kg). The highest detonation energy of any single munition used under the USAF's planned activities would be 945 lb (428.5 kg) NEW, which was also the highest NEW for a single munition in the previous LOA Request. The munitions having this NEW include the largest bombs.

Note that the types of munitions that would be used for SINKEX testing are controlled information and, therefore, not identified in this LOA Request. For the purpose of analysis, SINKEX exercises are assigned to mission-day category J, which represents a single subsurface detonation of 945 lb NEW. SINKEX exercises would not exceed this NEW. The 2 annual SINKEX exercises are added to the other 8 annual missions involving subsurface detonations of these bombs, resulting in 10 total annual missions under mission-day category J.

As indicated in Table 24, a total of 19 mission-day categories (A through S) were developed as a part of this LOA application. The table also contains information on the number of munitions per day, number of mission days per year, annual quantity of munitions and the NEWi per mission day.

**Table 24--Mission-Day Categories for Acoustic Impact Analysis**

User Group	Mission-Day Category	Category	NEWi (lb)/kg	Detonation Scenario	Munitions per Day	Mission Days per Year	Annual Quantity	NEWi per Mission Day (lb)/(kg)
53 WEG	A	Missile	241.36 (109.4)	Surface	4	1	4	2,413.6 (1,095.9)
		Missile	241.36 (109.4)	Surface	3	1	3	
		Missile	241.36 (109.4)	Surface	3	1	3	
	B	Bomb (Mk-82)	192.3 (87.2)	Surface	4	1	4	2,029.9 (920.5)
		Bomb (Mk-82)	192.3 (87.2)	Surface	4	1	4	
		Missile	98.3 (44.6)	Surface	5	1	5	
	C	Missile	98.3 (44.6)	Surface	5	1	5	1,376.2 (624.1)
		Missile	98.3 (44.6)	Surface	5	1	5	
		Missile	98.3 (44.6)	Surface	4	1	4	
	D	Missile	98.3 (44.6)	Surface	5	1	5	836.22 (379.2)
		Missile	36.18 (16.4)	Surface	4	1	4	
		Missile	20 (9.1)	Surface	10	1	10	
		Missile	13.08 (5.9)	Surface	4	1	4	
		Missile	13.08 (5.9)	Surface	4	1	4	
		Missile	13.08 (5.9)	Surface	4	1	4	
		Missile	13.08 (5.9)	Surface	4	1	4	
		Missile	13.08 (5.9)	Surface	4	1	4	

	E	Missile	13.08 (5.9)	Surface	4	1	4	997.62 (452.4)
		Rocket	3.8 (1.7)	Surface	12	1	12	
		Missile	13.08 (5.9)	Surface	4	1	4	
		Gun Ammunition	4.72 (2.1)	Surface	100	1	100	
		Bomb	36.1 (13.3)	Surface	2	1	2	
		Bomb	36.1 (16.3)	Surface	4	1	4	
		Missile	0 <sup>a</sup>	Surface	2	1	2	
		Missile	0 <sup>a</sup>	Surface	2	1	2	
		Missile	0 <sup>a</sup>	Surface	2	1	2	
		Missile	0 <sup>a</sup>	Surface	2	1	2	
		Bomb	0.49 (0.2)	Surface	4	1	4	
		Bomb	0.44 (0.2)	Surface	8	1	8	
AFSOC	F	Bomb (Mk-82)	192.3 (87.2)	Surface	2	15	30	584.6 (263.1)
		Bomb	100 (45.3)	Surface	2	15	30	
AFSOC	G	Gun Ammunition	4.72 (2.1)	Surface	30	25 (daytime )	750	191.6 (86.8)
		Gun Ammunition	0.1 (0.01)	Surface	500		12,500	
	H	Gun Ammunition	0.37 (0.2)	Surface	30	45 (nighttime)	1,350	61.1 (27.7)
		Gun Ammunition	0.1 (0.01)	Surface	500		22,500	
	I	Rocket	3.8 (1.7)	Surface	8	50	400	30.4 (13.8)
	J	Bomb (Mk-84)	946.8 (429.4)	Subsurface	1	10 <sup>b</sup>	10 <sup>b</sup>	946.8 (429.4)
	K	Hypersonic Weapon	350 (158.7)	Surface	1	2	2	350 (158.7)
		Missile	241.36	Surface	2	1	2	

96 OG	L		(109.4)					627.12 (284.3)
		Bomb	72.2 (32.7) <sup>c</sup>	Surface	2	1	2	
	M	Bomb	36.1 13.3)	Surface	4	2	8	324.9 (147.3)
		Bomb	36.1 (16.3)	Surface	5	2	10	
	N	Bomb	36.1 (16.3)	Surface	2	1	2	238.08 (107.9)
		Missile	40 (18.1)	Surface	3	1	3	
		Bomb	22.94 (10.4)	Surface	2	1	2	
	O	Missile	13.08 (5.9)	Surface	8	4	36	104.64 (47.5)
	P	Missile	13.08 (5.9)	Surface	5	2	10	130.8 (59.3)
		Missile	13.08 (5.9)	Surface	5	2	10	
	Q	Gun Ammunition	4.72 (2.1)	Surface	20	3	60	94.4 (42.8)
	R	Bomb	0.49 (0.2)	Surface	4	1	4	35.82 (16.2)
		Bomb	0.44 (0.2)	Surface	4	1	4	
		Gun Ammunition	0.37 (0.2)	Surface	60	1	60	
		Gun Ammunition	0.1 (0.01)	Surface	99	1	99	
NAVSCOLE OD	S	Charge	20 (9.07) <sup>d</sup>	Subsurface	4	8	32	130 (58.9)
		Charge	5 (2.3) <sup>d</sup>	Surface	10	8	80	

<sup>a</sup> Warhead replaced by FTS/TM. Identified NEW is for the FTS.

<sup>b</sup> Includes 2 SINKEX exercises.

<sup>c</sup> NEW is doubled for simultaneous launch.

<sup>d</sup> Estimated.

## *Marine Mammal Density*

Densities of the common bottlenose dolphin, Atlantic spotted dolphin, and Rice's whale in the study area are based on habitat-based density models and spatial density models developed by the NOAA Southeast Fisheries Science Center for the species in the Gulf of Mexico (NOAA 2022). The density models, herein referred to as the NOAA model, integrated visual observations from aerial and shipboard surveys conducted in the Gulf of Mexico from 2003 to 2019.

The NOAA model was used to predict the average density of the common bottlenose dolphin and Atlantic spotted dolphin in the existing LIA and planned East LIA. The model generates densities for hexagon-shaped raster grids that are 40 square kilometers (km<sup>2</sup>). The average annual density of each dolphin species in the existing LIA and East LIA was computed in a geographic information system (GIS) based on the densities of the raster grids within the boundaries of each LIA. To account for portions of the grids outside of the LIA, the species density value of each grid was area-weighted based on the respective area of the grid within the LIA. For example, the density of a grid that is 70 percent within the LIA would be weighted to reflect only the 70 percent grid area, which contributes to the average density of the entire LIA. The density of the 30 percent grid area outside the LIA does not contribute to the average LIA density, so it is not included in the estimation. The resulting area-weighted densities of all the grids were summed to determine the average annual density of each dolphin species within each LIA. The densities of dolphins estimated are presented in Table 25.

**Table 25--Predicted Dolphin Densities in the Existing LIA and New East LIA**

Species	Density Estimate (animals per km <sup>2</sup> ) <sup>a</sup>	
	Existing LIA	East LIA
Atlantic spotted dolphin	0.032	0.038
Common bottlenose dolphin	0.261	0.317

<sup>a</sup> Estimated average density within LIA based on spatial density model developed by NOAA (2022).

The NOAA model was used to determine Rice's whale density in the exposure analysis conducted for the Rice's whale in this LOA Request. Areas of Rice's whale exposure to pressure and impulsive noise from munitions use, predicted by underwater acoustic modeling and quantified by GIS analysis, were coupled with the associated modeled grid densities from the NOAA model to estimate abundance of affected animals.

### *Take Estimation*

The distances from the live ammunition detonation point that correspond to the various effect thresholds described previously are referred to as threshold distances. The threshold distances were calculated using dBSea for each mission-day category for each marine mammal species. The model was run assuming that the detonation point is at the center of the existing LIA, the SEL threshold distances are the same for the East LIA, and all missions are conducted in either the existing LIA or East LIA. Model outputs for the two LIAs are statistically the same as a result of similarities in water depths, sea bottom profiles, water temperatures, and other environmental characteristics. Tables 26, 27, and 28 present the threshold distances estimated for the dolphins and Rice's whale, respectively, for live missions in the existing LIA.

The threshold distances were used to calculate the harassment zones for each effect threshold for each species. The thresholds resemble concentric circles, with the most severe (mortality) being closest to the center (detonation point) and the least severe (behavioral disturbance) being farthest from the center. The areas encompassed by the concentric thresholds are the impact areas associated with the applicable criteria. To prevent double counting of animals, areas associated with higher-impact criteria were subtracted from areas associated with lower-impact criteria. To estimate the number of animals potentially exposed to the various thresholds within the harassment zone, the adjusted impact area was multiplied by the predicted animal density and the annual number of events for each mission-day category. The results were rounded at the annual mission-day level and then summed for each criterion to estimate the total

annual take numbers for each species. For impulse and SPL metrics, a take is considered to occur if the received level is equal to or above the associated threshold. For SEL metrics, a take is considered to occur if the received level is equal to or above the associated threshold within the appropriate frequency band of the sound received, adjusted for the appropriate weighting function value of that frequency band. For impact categories with multiple criteria (*e.g.*, non-auditory injury and PTS for Level A harassment) and criteria with two thresholds (*e.g.*, SEL and SPL for PTS), the criterion and/or threshold that yielded the higher exposure estimate was used. Threshold distances for dolphins are shown in Table 26 and 27, while Table 28 contains threshold distances for Rice's whale.

**Table 26--Bottlenose Dolphin Threshold Distances (in km) for Live Missions in the Existing Live Impact Area**

Mission-Day Category	Mortality	Level A Harassment				Level B Harassment		
		Slight Lung Injury	GI Tract Injury	PTS		TTS		Behavioral <sup>a</sup>
	Positive Impulse B: 248.4 Pa·s AS: 197.1 Pa·s	Positive Impulse B: 114.5 Pa·s AS: 90.9 Pa·s	Peak SPL 237 dB	Weighted SEL 185 dB	Peak SPL 230 dB	Weighted SEL 170 dB	Peak SPL 224 dB	Weighted SEL 165 dB
Bottlenose Dolphin								
A	0.139	0.276	0.194	0.562	0.389	5.59	0.706	9.538
B	0.128	0.254	0.180	0.581	0.361	5.215	0.655	8.937
C	0.100	0.199	0.144	0.543	0.289	4.459	0.524	7.568
D	0.100	0.199	0.144	0.471	0.289	3.251	0.524	5.664
E	0.068	0.136	0.103	0.479	0.207	3.272	0.377	5.88
F	0.128	0.254	0.180	0.352	0.362	2.338	0.655	4.596
G	0.027	0.054	0.048	0.274	0.093	1.095	0.165	2.488
H	0.010	0.019	0.021	0.225	0.040	0.809	0.071	1.409
I	0.025	0.049	0.045	0.136	0.087	0.536	0.154	0.918
J	0.228	0.449	0.306	0.678	0.615	3.458	1.115	6.193
K	0.158	0.313	0.222	0.258	0.445	1.263	0.808	2.663
L	0.139	0.276	0.194	0.347	0.389	2.35	0.706	4.656

M	0.068	0.136	0.103	0.286	0.207	1.446	0.377	3.508
N	0.073	0.145	0.113	0.25	0.225	1.432	0.404	2.935
O	0.046	0.092	0.078	0.185	0.155	0.795	0.278	1.878
P	0.046	0.092	0.078	0.204	0.155	0.907	0.278	2.172
Q	0.027	0.054	0.048	0.247	0.093	0.931	0.165	1.563
R	0.012	0.024	0.026	0.139	0.052	0.537	0.093	0.91
S	0.053	0.104	0.084	0.429	0.164	1.699	0.294	2.872

<sup>a</sup>Behavioral threshold for multiple detonations assumes TTS threshold minus 5 dB.

**Table 27--Atlantic Spotted Dolphin Threshold Distances (in km) for Live Missions in the Existing Live Impact Area**

Mission-Day Category	Mortality	Level A Harassment				Level B Harassment		
		Slight Lung Injury	GI Tract Injury	PTS		TTS		Behavioral <sup>a</sup>
	Positive Impulse B: 248.4 Pa·s AS: 197.1 Pa·s	Positive Impulse B: 114.5 Pa·s AS: 90.9 Pa·s	Peak SPL 237 dB	Weighted SEL 185 dB	Peak SPL 230 dB	Weighted SEL 170 dB	Peak SPL 224 dB	Weighted SEL 165 dB
Atlantic Spotted Dolphin								
A	0.171	0.338	0.194	0.562	0.389	5.59	0.706	9.538
B	0.157	0.311	0.180	0.581	0.361	5.215	0.655	8.937
C	0.123	0.244	0.144	0.543	0.289	4.459	0.524	7.568
D	0.123	0.244	0.144	0.471	0.289	3.251	0.524	5.664
E	0.084	0.168	0.103	0.479	0.207	3.272	0.377	5.88
F	0.157	0.312	0.180	0.352	0.362	2.338	0.655	4.596
G	0.033	0.066	0.048	0.274	0.093	1.095	0.165	2.488
H	0.012	0.023	0.021	0.225	0.040	0.809	0.071	1.409
I	0.030	0.060	0.045	0.136	0.087	0.536	0.154	0.918
J	0.279	0.550	0.306	0.678	0.615	3.458	1.115	6.193
K	0.194	0.384	0.222	0.258	0.445	1.263	0.808	2.663
L	0.171	0.338	0.194	0.347	0.389	2.35	0.706	4.656
M	0.084	0.168	0.103	0.286	0.207	1.446	0.377	3.508
N	0.090	0.179	0.113	0.25	0.225	1.432	0.404	2.935
O	0.057	0.113	0.078	0.185	0.155	0.795	0.278	1.878
P	0.057	0.113	0.078	0.204	0.155	0.907	0.278	2.172
Q	0.033	0.066	0.048	0.247	0.093	0.931	0.165	1.563

R	0.015	0.030	0.026	0.139	0.052	0.537	0.093	0.91
S	0.065	0.128	0.084	0.429	0.164	1.699	0.294	2.872

<sup>a</sup>Behavioral threshold for multiple detonations assumes TTS threshold minus 5 dB.

**Table 28--Rice's Whale Threshold Distances (in km) for Live Missions in the Existing Live Impact Area**

Mission-Day Category	Mortality	Level A Harassment				Level B Harassment		
		Slight Lung Injury	GI Tract Injury	PTS		TTS		Behavioral <sup>a</sup>
	Positive Impulse 906.2 Pa·s	Positive Impulse 417.9 Pa·s	Peak SPL 237 dB	Weighted SEL 183 dB	Peak SPL 219 dB	Weighted SEL 168 dB	Peak SPL 213 dB	Weighted SEL 163 dB
A	0.044	0.088	0.194	5.695	1.170	21.435	2.120	27.923
B	0.041	0.81	0.180	5.253	1.076	20.641	1.955	26.845
C	0.031	0.063	0.144	4.332	0.861	18.772	1.562	24.526
D	0.031	0.063	0.144	2.979	0.861	16.419	1.562	21.579
E	0.021	0.043	0.103	2.323	0.617	15.814	1.121	21.22
F	0.041	0.081	0.180	2.208	1.076	14.403	1.955	19.439
G	0.009	0.017	0.048	0.494	0.266	7.532	0.470	12.92
H	0.003	0.006	0.021	0.401	0.114	3.624	0.201	7.065
I	0.008	0.016	0.045	0.305	0.247	2.95	0.437	6.059
J	0.073	0.145	0.306	4.487	1.830	13.216	3.323	16.88
K	0.050	0.100	0.222	0.831	1.320	7.723	2.393	11.809
L	0.044	0.088	0.194	2.325	1.170	15.216	2.120	20.319
M	0.021	0.043	0.103	1.304	0.617	11.582	1.121	16.688
N	0.023	0.046	0.113	1.026	0.658	9.904	1.183	14.859
O	0.015	0.029	0.078	0.611	0.460	6.926	0.832	11.159
P	0.014	0.029	0.078	0.671	0.460	7.841	0.832	12.307
Q	0.009	0.017	0.048	0.549	0.266	6.299	0.470	10.393
R	0.004	0.008	0.026	0.283	0.152	2.383	0.273	5.06
S	0.017	0.034	0.084	0.938	0.473	8.676	0.843	12.874

<sup>a</sup>Behavioral threshold for multiple detonations assumes TTS threshold minus 5 dB.

As discussed previously and shown in Table 21, a portion of the kinetic energy released by an inert munition at impact is transmitted as underwater acoustic energy in a pressure impulse. The planned inert munitions were categorized into four classes based on their impact

energies to assess the potential impacts of inert munitions on marine mammals. The threshold distances for each class were modeled and calculated as described for the mission-day categories. Table 29 presents the impact energy classes developed for the inert munitions. The four impact energy classes represent the entire suite of inert munitions planned to be used in the EGTTR during the next mission period. The impact energy is the portion of the kinetic energy at impact that is transmitted as an underwater pressure impulse, expressed in units of TNT-equivalent (TNTEq). Tables 29 and 30 present the threshold distances estimated for the dolphins and Rice's whale, respectively, for inert munitions in the existing LIA.

**Table 29--Dolphin Threshold Distances (in km) for Inert Munitions in the Existing Live Impact Area**

Inert Impact Class (lb TNTeq)	Mortality	Level A Harassment				Level B Harassment		
		Slight Lung Injury	GI Tract Injury	PTS		TTS		Behavioral
	Positive Impulse B: 248.4 Pa·s AS: 197.1 Pa·s	Positive Impulse B: 114.5 Pa·s AS: 90.9 Pa·s	Peak SPL 237 dB	Weighted SEL 185 dB	Peak SPL 230 dB	Weighted SEL 170 dB	Peak SPL 224 dB	Weighted SEL 165 dB
Bottlenose Dolphin								
2	0.020	0.041	0.040	0.030	0.080	0.205	0.145	0.327
1	0.015	0.031	0.032	0.025	0.063	0.134	0.114	0.250
0.5	0.012	0.023	0.025	0.015	0.050	0.119	0.091	0.198
0.15	0.008	0.015	0.017	0.009	0.034	0.061	0.061	0.119
Atlantic Spotted Dolphin								
2	0.025	0.051	0.040	0.030	0.080	0.205	0.145	0.327
1	0.019	0.038	0.032	0.025	0.063	0.134	0.114	0.250
0.5	0.014	0.029	0.025	0.015	0.050	0.119	0.091	0.198
0.15	0.009	0.018	0.017	0.009	0.034	0.061	0.061	0.119

<sup>a</sup>Behavioral threshold for multiple detonations assumes TTS threshold minus 5 dB.

**Table 30--Rice's Whale Threshold Distances (in km) for Inert Munitions in the Existing Live Impact Area**

		Level A Harassment	Level B Harassment
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Inert Impact Class (lb TNTeq)	Mortality	Slight Lung Injury	GI Tract Injury	PTS		TTS		Behavioral <sup>a</sup>
	Positive Impulse	Positive Impulse	Peak SPL	Weighted SEL	Peak SPL	Weighted SEL	Peak SPL	Weighted SEL
	906.2 Pa·s	417.9 Pa·s	237 dB	183 dB	219 dB	168 dB	213 dB	163 dB
2	0.006	0.013	0.040	0.151	0.238	0.474	0.430	0.884
1	0.005	0.010	0.032	0.110	0.188	0.327	0.340	0.542
0.5	0.004	0.007	0.025	0.055	0.149	0.261	0.270	0.521
0.15	0.002	0.005	0.017	0.026	0.100	0.154	0.181	0.284

<sup>a</sup>Behavioral threshold for multiple detonations assumes TTS threshold minus 5 dB.

### *Dolphin Species*

Estimated takes for dolphins are based on the area of the Level A and Level B harassment zones, predicted dolphin density, and annual number of events for each mission-day category. As previously discussed, take estimates for dolphins are based on the average yearly density of each dolphin species in each LIA. To estimate the takes of each dolphin species in both LIAs collectively, the take estimates for each LIA were weighted based on the expected usage of each LIA over the 7-year mission period. This information was provided by the user groups. Ninety percent of the total missions are expected to be conducted in the existing LIA and 10 percent are expected to be conducted in the East LIA. Therefore, total estimated takes are the sum of 90 percent of the takes in the existing LIA and 10 percent of the takes in the East LIA. Should the usage ratio change substantially in the future, USAF would re-evaluate the exposure estimates and reinitiate consultation with NMFS to determine whether the take estimations need to be adjusted.

**Table 31--Calculated Annual Exposures of Dolphins under the USAF's Planned Activities**

	Mortality	Level A Harassment		Level B Harassment	
		Injury <sup>a</sup>	PTS	TT S	Behavioral
Bottlenose Dolphin					
Missions at Existing LIA	0.74	2.14	9.25	312.7	799.7
Missions at East LIA	0.89	2.6	11.24	379.79	971.29
90 Percent of Existing LIA Missions	0.66	1.92	8.33	281.4	719.73

10 Percent of East LIA Missions	0.09	0.26	1.12	37.98	97.13
Total	0.75	2.18	9.45	319.14	816.86
Total Takes Requested	0	0	9	319	817
Atlantic Spotted Dolphin					
Missions at Existing LIA	0.14	0.39	0.96	38.34	98.05
Missions at East LIA	0.16	0.47	1.14	45.53	116.43
90 Percent of Existing LIA Missions	0.12	0.36	0.86	34.50	88.24
10 Percent of East LIA Missions	0.02	0.05	0.11	4.55	11.64
Total	0.14	0.4	0.98	39.06	99.89
Total Takes	0	0	1	39	100

<sup>a</sup> Slight lung and/or gastrointestinal tract injury

The annual exposures of dolphins requested by the USAF and authorized by NMFS are presented in Table 31. As indicated, a total of 9 Level A harassment takes and 1,136 Level B harassment takes of the common bottlenose dolphin, and 1 Level A harassment takes and 139 Level B harassment takes of the Atlantic spotted dolphin are requested annually for EGTRR operations during the next 7-year mission period. The presented takes are overestimates of actual exposure based on the conservative assumption that all planned detonations would occur at or just below the water surface instead of a portion occurring upon impact with targets.

Based on the best available science, the USAF (in coordination with NMFS) used the acoustic and pressure thresholds indicated in Tables 25-29 to predict the onset of tissue damage and mortality for explosives (impulsive) and other impulsive sound sources for inert and live munitions in both the existing LIA and East LIA. The mortality takes calculated for the bottlenose dolphin (0.75) and Atlantic spotted dolphin (0.14) are both less than one animal. Mortality for Rice's whale is zero. Therefore, and in consideration of the required mitigation measures, no mortality takes are requested for either dolphin species or Rice's whale. The non-auditory injury takes are calculated to be 2.18 and 0.40 for the bottlenose dolphin and Atlantic spotted dolphin, respectively. However, these (and the take estimates for the other effect thresholds) are the sum of the respective takes for all 19 mission-day categories. Each individual

mission-day category results in a fraction of a non-auditory injury take. Given the required mitigation, adding up all the fractional takes in this manner would likely result in an over-estimate of take. Calculated non-auditory injury for the Rice's whale is zero.

The mitigation measures associated with explosives are expected to be effective in preventing mortality and non-auditory tissue damage to any potentially affected species. All of the calculated distances to mortality or non-auditory injury thresholds are less than 400 m. The USAF would be required to employ trained PSOs to monitor the mitigation zones based on the mission-day activities. The mitigation zone is defined as double the threshold distance at which Level A harassment exposures in the form of PTS could occur (also referred to below as “double the Level A PTS threshold distance”). During pre-monitoring PSOs would be required to postpone or cancel operations if animals are found in these zones. Protected species monitoring would be vessel-based, aerial-based or remote video-based depending on the mission-day activities. The USAF would also be required to conduct testing and training exercises beyond setback distances shown in Table 32. These setback distances would start from the 100-m isobath, which is approximately the shallowest depth where the Rice's whale has been observed. The setback distances are based on the PTS threshold calculated for the Rice's whale depending on the mission-day activity. Also, all gunnery missions must take place 500 m landward of the 100-m isopleth to avoid impacts to the Rice's whale. When these mitigation measures are considered in combination with the modeled exposure results, no species are anticipated to incur mortality or non-auditory tissue damage during the period of this rule.

Based on the conservative assumptions applied to the impact analysis and the pre-mission surveys conducted for dolphins, which extend out to, at a minimum, twice the PTS threshold distance that applies to both dolphin species (185 dB SEL), NMFS has determined that no mortality or non-auditory injury takes are expected and none are authorized for EGTRR operations.

*Rice's Whale*

Figure 6-2 in the LOA application shows the estimated Rice's whale threshold distances and associated harassment zones for mission-day category A, J, and P and use of a 2 lb class inert munition at the location where the GRATV is typically anchored in the existing LIA. As indicated on Figure 6-2, portions of the behavioral harassment zone of mission-day categories A and J extend into Rice's whale habitat, whereas the monitoring zones for mission-day category P and the largest inert munition are entirely outside Rice's whale habitat. The monitoring zone is defined as the area between double the Level A harassment mitigation zone and the human safety zone perimeter. As previously discussed, the spatial density model developed by NOAA (2022) for the Rice's whale was used to predict Rice's whale density for the purpose of estimating takes. The NOAA model generates densities for hexagon-shaped raster grids that are 40 km<sup>2</sup>. The specific areas of the raster grids within each of the Level A and Level B harassment zones were computed in GIS and coupled with their respective modeled densities to estimate the number of animals that would be exposed.

Figure 6-3 in the LOA application shows the harassment zones of mission-day category A at the current GRATV anchoring site. As shown, portions of the mitigation zones (TTS and behavioral disturbance) are within grids of modeled density greater than zero individuals per 40 km<sup>2</sup>. However, the modeled densities in these areas are small and reflect higher occurrence probability for the Rice's whale farther to the southwest, outside the LIA. To estimate annual takes, the number of animals in all model grids within each mitigation, monitoring zone, and Level B harassment (behavioral) zone for all mission-day categories, except gunnery missions (G and H), were computed using the densities from the NOAA model (2022) model and the impact areas calculated in GIS. The modeled densities and the associated areas were multiplied together to estimate abundance within each mitigation, monitoring, and Level B harassment zone. The resulting abundance estimates were summed together and then multiplied by the number of annual missions planned to estimate annual takes. These calculations resulted in a total of 0.04 annual TTS take and 0.10 annual behavioral disturbance take, which indicates that

all missions conducted at the current GRATV site combined would not result in a single Level B harassment take of the Rice's whale. For comparison, Figure 6-4 shows the harassment zones of mission-day category A at the center of the East LIA. As shown, a small portion of the behavioral disturbance zone (27.9 km) encompasses a grid of low modeled density, with grids of higher density being farther to the southwest.

Certain missions could have a PTS impact if they were to be conducted farther to the southwest within the LIAs closer to Rice's whale habitat, as defined by the 100-m isobath. The modeled threshold distances were used to determine the locations in the existing LIA and East LIA where each mission-day category would cause the onset of PTS, measured as a setback from the 100-m isobath. At this setback location, the mission would avoid PTS and result only in non-injury Level B harassment, if one or more Rice's whales were in the affected habitat. The setback distances are based on the longest distance predicted by the dBSea model for a cumulative SEL of 168 dB within the mitigation zone; the predicted average cumulative SEL is used as the basis of effect for estimating takes. The setback distances determined for the mission-day categories are presented in Table 32 and are shown for the existing LIA and East LIA on Figures 6-5 and 6-6, respectively.

**Table 32--Setbacks to Prevent Permanent Threshold Shift Impacts to the Rice's Whale**

User Group	Mission-Day Category	NEWi (lb)/(kg)	Setback from 100-Meter Isobath (km)/(nmi)
53 WEG	A	2,413.6 (1094.6)	7.323 (3.95)
	B	2,029.9 (920.6)	6.659 (5.59)
	C	1,376.2 (624.1)	5.277 (2.84)
	D	836.22 (379.2)	3.557 (1.92)
	E	934.9 (423.9)	3.192 (1.72)
AFSOC	F	584.6 (265.1)	3.169 (1.71)
	I	29.6 (13.4)	0.394 (0.21)
96 OG	J	946.8 (429.4)	5.188 (2.80)
	K	350 (158.7)	1.338 (0.72)
	L	627.1 (284.3)	3.315 (1.78)
	M	324.9 (147.3)	2.017 (1.08)
	N	238.1 (107.9)	1.815 (0.98)
	O	104.6 (47.5)	0.734 (0.39)

	P	130.8 (59.3)	0.787( 0.42)
	Q	94.4 (42.8)	0.667(0.36)
	R	37.1 (16.8)	0.368 (0.19)
NAVSCOLEO D	S	130 (58.9)	1.042 (0.56)

Locating a given mission in the LIA at its respective setback distance would represent the maximum Level B harassment scenario for the mission. If all the missions were conducted at their respective setbacks, the resulting takes would represent the maximum Level B harassment takes that would result for all mission-day categories except for gunnery missions. This is not a realistic scenario; however, it is analyzed to provide a worst-case estimate of takes. The takes under this scenario were calculated using the NOAA model (2022) model as described for the GRATV Location scenario. Figure 6-7 shows mission-day category A conducted at its maximum Level B harassment setback location (7.23 km). Under this scenario, the TTS and behavioral disturbance mitigation zones extend farther into Rice's whale habitat. However, the modeled densities within affected areas are still relatively small. PTS impacts are avoided entirely. The PTS mitigation zone is slightly offset from the 100-m isobath because the setback is based on the longest distance predicted by the dBSea model, whereas the mitigation zones shown are based on the average distance predicted by the model. The take calculations for the maximum Level B harassment scenario resulted in a total of 0.49 annual TTS takes and 1.19 annual behavioral disturbance takes as shown in Table 33. These are the maximum number of takes estimated to potentially result from detonations in the existing LIA. These takes are overestimates because a considerable portion of all missions in the LIA are expected to continue to be conducted at or near the currently used GRATV anchoring site. These takes would not be exceeded because all missions will be conducted behind their identified setbacks as a new mitigation measure to prevent injury to the Rice's whale. Take calculations for the maximum Level B harassment scenario in the East LIA resulted in 0.63 annual TTS takes and 2.33 annual behavioral disturbance takes (Table 33). However, if we assume that 90 percent of the mission would occur

in existing LIA and 10 percent would occur in the East LIA as was done for dolphins, the estimated result is 0.55 annual TTS ( $0.49 + 0.06$ ) and 1.42 annual behavioral ( $1.19 + 0.23$ ) takes.

The take calculations were performed using the NOAA (2022) density model for both day and night gunnery missions. As indicated on Figures 6-8 and 6-9 in the application, the modeled Rice's whale densities in the TTS and behavioral disturbance zones are small, and reflect a higher occurrence probability for the Rice's whale farther to the southwest. The take calculations estimated 0.003 TTS takes and 0.012 behavioral disturbance takes per daytime gunnery mission and 0.0006 TTS takes and 0.002 behavioral disturbance takes per nighttime gunnery mission. The resulting annual takes for all planned 25 daytime gunnery missions are 0.08 TTS take and 0.30 behavioral disturbance take, and the resulting annual takes for all 45 planned nighttime gunnery missions are 0.03 TTS take and 0.09 behavioral disturbance take (Table 33). This is a conservative estimation of Level B harassment takes because all gunnery missions would not be conducted precisely 500 m landward of the 100-m isobath as assumed under this worst-case take scenario. This represents a mitigation measure described later in the **Mitigation Measures** section. Based on a review of gunnery mission locations, most gunnery missions during the last 5 years have occurred in waters shallower than 100 m.

The annual maximum Level B harassment takes estimated for daytime gunnery missions (mission-day G) and nighttime gunnery missions (mission-day category H) are combined with the annual maximum Level B harassment takes estimated for the other mission-day categories to determine the total takes of the Rice's whale from all EGTTTR operations during the next mission period. The annual takes of the Rice's whale requested under the USAF's planned activities are 0.61 TTS takes conservatively and 1.69 behavioral takes as presented in Table 33. However, the average group size for Bryde's whales found in the northeast Gulf of Mexico is two animals (Maze-Foley and Mullin 2006). NMFS will assume that each exposure would result in take of two animals. Therefore, NMFS is authorizing Level B harassment in the form of two takes by

TTS and four takes by behavioral disturbance annually for EGTR operations during the next 7-year mission period.

Note that the authorized takes are likely overestimates because they represent the maximum Level B harassment scenario for all missions. These takes are also likely overestimates of actual exposure based on the conservative assumption that all planned detonations would occur at or just below the water surface instead of a portion occurring upon impact with targets.

**Table 33--Calculated Annual Exposures of the Rice's Whale under the USAF's Activities**

		Level A Harassment		Level B Harassment	
		Non-auditory Injury <sup>a</sup>	PTS	TTS	Behavioral Disturbance
Missions at Existing LIA	0	0	0	0.49	1.19
Missions at East LIA	0	0	0	0.63	2.33
90 Percent of Existing LIA Missions	0	0	0	0.441	1.071
10 Percent of East LIA Missions	0	0	0	0.063	0.233
Daytime Gunnery Missions	0	0	0	0.08	0.30
Nighttime Gunnery Missions	0	0	0	0.03	0.09
Total	0	0	0	0.61	1.69
Total Takes Requested	0	0	0	<u>2</u> <sup>b</sup>	<u>4</u> <sup>b</sup>

<sup>a</sup> Slight lung and/or gastrointestinal tract injury.

<sup>b</sup>Based on average group size (Maze-Foley and Mullin (2006)).

For the USAF's planned activities in the EGTR, Table 34 summarizes the take NMFS plans to authorize, including the maximum annual, 7-year total amount, and type of Level A harassment and Level B harassment that NMFS anticipates is reasonably likely to occur by species and stock. Note that take by Level B harassment includes both behavioral disturbance and TTS. No mortality or non-auditory injury is anticipated or authorized, as described previously.

**Table 34--Annual and Seven-Year Total Species-specific Take Authorization from Explosives for All Training and Testing Activities in the EGTR**

Common Name	Stock/DPS	Authorized Annual Take	Authorized 7-Year Total Take
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		Level A Harassment	Level B Harassment		Level A Harassment	Level B Harassment	
		PTS	TTS	Behavioral Disturbance	PTS	TTS	Behavioral Disturbance
Common bottlenose dolphin	Northern Gulf of Mexico Continental Shelf	9	319	817	63	2233	5719
Atlantic spotted dolphin	Northern Gulf of Mexico	1	39	100	7	273	700
Rice's whale*	NSD	0	2	4	0	14	28

\*ESA-listed species

Note: NSD = No stock designation

## Mitigation Measures

Under section 101(a)(5)(A) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable adverse impact on the species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, and their habitat (50 CFR 216.104(a)(11)). The NDAA for fiscal year (FY) 2004 amended the MMPA as it relates to military readiness activities and the incidental take authorization process such that “least practicable impact” shall include consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, NMFS considers two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

#### *Assessment of Mitigation Measures for the EGTTR*

Section 216.104(a)(11) of NMFS' implementing regulations requires an applicant for incidental take authorization to include in its request, among other things, "the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, their habitat, and [where applicable] on their availability for subsistence uses, paying particular attention to rookeries, mating grounds, and areas of similar significance." Thus, NMFS' analysis of the sufficiency and appropriateness of an applicant's measures under the least practicable adverse impact standard will always begin with evaluation of the mitigation measures presented in the application.

NMFS has fully reviewed the specified activities and the mitigation measures included in the USAF's rulemaking/LOA application and the EGTTR 2022 REA to determine if the mitigation measures would result in the least practicable adverse impact on marine mammals and

their habitat. The USAF would be required to implement the mitigation measures identified in this rule for the full 7 years to avoid or reduce potential impacts from planned training and testing activities.

Monitoring and mitigation measures for protected species are implemented for all EGTTTR missions that involve the use of live or inert munitions (*i.e.*, missiles, bombs, and gun ammunition). Mitigation includes operational measures such as pre-mission monitoring, postponement, relocation, or cancellation of operations, to minimize the exposures of all marine mammals to pressure waves and acoustic impacts as well as vessel strike avoidance measures to minimize the potential for ship strikes; geographic mitigation measures, such as setbacks and areas where mission activity is prohibited, to minimize impacts in areas used by Rice's whales; gunnery-specific mitigation measures which dictate how and where gunnery operations occur; and environmental mitigation which describes when missions may occur and under what weather conditions. These measures are supported by the use of PSOs from various platforms, and sea state restrictions. Identification and observation of appropriate mitigation zones (*i.e.* double the threshold distance at which Level A harassment exposures in the form of PTS could occur) and monitoring zones (*i.e.*, area between the mitigation zone and the human safety zone perimeter) are important components of an effective mitigation plan.

### *Operational Measures*

#### Pre-mission Surveys

Pre-mission surveys for protected species are conducted prior to every mission (*i.e.*, missiles, bombs, and gunnery) in order to verify that the mitigation zone is free of visually detectable marine mammals and to evaluate the mission site for environmental suitability. USAF range-clearing vessels and protected species survey vessels holding PSOs will be onsite approximately 90 minutes prior to the mission. The duration of pre-mission surveys depends on the area required to be surveyed, the type of survey platforms used (*i.e.*, vessels, aircraft, video), and any potential lapse in time between the end of the surveys and the beginning of the mission.

Depending on the mission category, vessel-based PSOs will survey the mitigation and/or monitoring zones for marine mammals. Surveys of the mitigation zone will continue for approximately 30 minutes or until the entire mitigation zone has been adequately surveyed, whichever takes longer. The mitigation zone survey area is defined by the area covered by double the dolphin Level A harassment (PTS) threshold distances predicted for the mission-day categories as presented previously in Tables 26 and 27. Each user group will identify the mission-day category that best corresponds to its actual mission based on the energy that would be released. The user group will estimate the NEWi of the actual mission to identify which mission-day category to use. The energy of the actual mission will be less than the energy of the mission-day category in terms of total NEWi and largest single munition NEWi to ensure that the energy and effects of the actual mission will not exceed the energy and effects estimated for the corresponding mission-day category. For any live mission other than gunnery missions, the pre-mission survey mitigation zone will extend out to, at a minimum, double the Level A harassment PTS threshold distance that applies to both dolphin species. Depending on the mission-day category that best corresponds to the actual mission, the distance from the detonation point to the mitigation zone (*i.e.*, double the Level A harassment (PTS) threshold distance) could vary between approximately 1,356 m for mission-day category J and 272 m for mission-day category I (Table 35). Surveying twice the dolphin Level A harassment (PTS) threshold distance provides a buffer area for when there is a lapse between the time when the survey ends and the time when the species observers reach the perimeter of the human safety zone before the start of the mission. Surveying this additional buffer area ensures that dolphins are not within the PTS zone at the start of the mission. Missions involving air-to-surface gunnery operations must conduct surveys of even larger areas based on previously established safety profiles and the ability to conduct aerial surveys of large areas from the types of aircraft used for these missions.

The monitoring zone for non-gunnery missions is the area between the mitigation zone and the human safety zone and is not standardized, since the size of the human safety zone is not standardized. The human safety zone will be determined per each mission by the Eglin AFB Test Wing Safety Office based on the munition and parameters of its release (to include altitude, pitch, heading, and airspeed). Additionally, based on the operational altitudes of gunnery firing, and the fact that the only monitoring during the mission will be coming from onboard the aircraft conducting the live firing, the monitoring zone for gunnery missions will be a smaller area than the mitigation zone and will be based on the field of view from the aircraft. These observable areas will at least be double the Level A harassment (PTS) threshold distance for the mission-day categories G, H, and Q (gunnery-only mission-day categories) as shown in Table 35.

**Table 35--Mitigation and Monitoring Zone Sizes for Live Missions in the Existing Live Impact Area (m)**

Mission-day Category	Mitigation Zone (m) /(ft)	Monitoring Zone <sup>5, 6</sup>
A	1,130 (3,706.4)	TBD
B	1,170 (3,837.6)	TBD
C	1,090 (3,575.2)	TBD
D	950 (3,116)	TBD
E	960 (3,150)	TBD
F	710 (2,328)	TBD
G	9,260 (30,372.8) <sup>1</sup>	550 (1,804)
H	9,260 (30,372.8) <sup>2</sup>	450 (1,476)
I	280 (918.4)	TBD
J	1,360 (4,460.8)	TBD
K	890 (2,920)	TBD
L	780 (2,560)	TBD
M	580 (1,640)	TBD
N	500 (1,640)	TBD
O	370 (1,213.6)	TBD
P	410 (1,344.8)	TBD
Q	9,260 (30,372.6) <sup>3</sup>	500 (1,640)

R	280 (918.4) and 9,260 (30372.8) <sup>4</sup>	TBD
S	860 (2,820.8)	TBD

<sup>1</sup> For G, double the Level A harassment threshold distance (PTS) is 0.548 km, but G is AC-130 gunnery mission with an inherent mitigation zone of 9.260 km/5 nmi.

<sup>2</sup> For H, double the Level A harassment (PTS) threshold distance is 0.450 km, but H is AC-130 gunnery mission with an inherent mitigation zone of 9.260 km/5 nmi.

<sup>3</sup> For Q, double the Level A harassment (PTS) threshold distance is 0.494 km, but Q is AC-130 gunnery mission with an inherent mitigation zone of 9.260 km/5 nmi.

<sup>4</sup> R has components of both gunnery and inert small diameter bomb. Double the Level A harassment (PTS) threshold distance is 0.278 km, however, for gunnery component the inherent mitigation zone would be 9.260 km.

<sup>5</sup> The monitoring zone for non-gunnery missions is the area between the mitigation zone and the human safety zone and is not standardized, as the human safety zone (HSZ) is not standardized. The HSZ is determined per each mission by the Test Wing Safety Office based on the munition and parameters of its release (to include altitude, pitch, heading, and airspeed).

<sup>6</sup> Based on the operational altitudes of gunnery firing, and the only monitoring during mission coming from onboard the aircraft conducting the firing, the monitoring zone for gunnery missions will be a smaller area than the mitigation zone and be based on the field of view from the aircraft. These observable areas will at least be double the Level A harassment (PTS) threshold distance for the mission-day categories G, H, and Q (gunnery-only mission-day categories).

For non-gunnery inert missions, the mitigation zone is based on double the Level A harassment (PTS) threshold distance as shown in Table 36. The monitoring zone is the area between the mitigation zone and the human safety zone which is not standardized. The safety zone is determined per each mission by the Test Wing Safety Office based on the munition and parameters of its release including altitude, pitch, heading, and airspeed.

**Table 36--Pre-mission Mitigation and Monitoring Zones (in m) for Inert Missions Impact Area**

Inert Impact Class (lb TNTeq)	Mitigation Zone m/(ft)	Monitoring Zone <sup>1</sup>
2	160 (524)	TBD
1	130 (426)	TBD
0.5	100 (328)	TBD
0.15	70 (230)	TBD

<sup>1</sup> The monitoring zone for non-gunnery missions is the area between the mitigation zone and the human safety zone and is not standardized, as the human safety zone is not standardized. The HSZ is determined per each mission by the Test Wing Safety Office based on the munition and parameters of its release (to include altitude, pitch, heading, and airspeed).

Mission postponement, relocation, or cancellation - Mission postponement, relocation, or cancellation would be required when marine mammals are observed within the mitigation or monitoring zone depending on the mission type to minimize the potential for marine mammals to

be exposed to injurious levels of pressure and noise energy from live detonations. If one or more marine mammal species other than the two dolphin species for which take is authorized are detected in either the mitigation zone or the monitoring zone, then mission activities will be cancelled for the remainder of the day. The mission must be postponed, relocated or canceled if either of the two dolphin species are visually detected in the mitigation zone during the pre-mission survey. If members of the two dolphin species for which authorized take has been authorized are observed in the monitoring zone while vessels are exiting the human safety zone and the PSO has determined the animals are heading towards the mitigation zone, then missions will be postponed, relocated, or canceled, based on mission-specific test and environmental parameters. Postponement would continue until the animals are confirmed to be outside of the mitigation zone on a heading away from the targets or are not seen again for 30 minutes and are presumed to be outside the mitigation zone. If large schools of fish or large flocks of birds are observed feeding at the surface are observed within the mitigation zone, postponement would continue until these potential indicators of marine mammal presence are confirmed to be outside the mitigation zone.

Vessel strike avoidance measures - Vessel strike avoidance measures as previously advised by NMFS Southeast Regional Office must be employed by the USAF to minimize the potential for ship strikes. These measures include staying at least 150 ft (46 m) away from protected species and 300 ft (92 m) away from whales. Additional action area measures will require vessels to stay 500 m away from the Rice's whale. If a baleen whale cannot be positively identified to species level then it must be assumed to be a Rice's whale and 500 m separation distance must be maintained. Vessels must avoid transit in the Core Distribution Area (CDA) and within the 100 - 400 m isobath zone outside the CDA. If transit in these areas is unavoidable, vessels must not exceed 10 knots and transit at night is prohibited. An exception to the speed restriction is for instances required for human safety, such as when members of the public need

to be intercepted to secure the human safety zone, or when the safety of a vessel operations crew could be compromised.

### *Geographic Mitigation Measures*

#### Setbacks from Rice's whale habitat

New mitigation measures that were not required as part of the existing LOA have been developed to reduce impacts to the Rice's whale. These measures would require that given mission-day activities could only occur in areas that are exterior to and set back some specified distance from Rice's whale habitat boundaries as well as areas where mission activities are prohibited. These are described below.

As a mitigation measure to prevent impacts to cetacean species known to occur in deeper portions of the Gulf of Mexico, such as the federally endangered sperm whale, all gunnery missions have been located landward of the 200-m isobath, which is generally considered to be the shelf break in the Gulf of Mexico. Most missions conducted over the last 5 years under the existing LOA have occurred in waters less than 100 m in depth. While implementing this measure would prevent impacts to most marine mammal species in the Gulf, it may not provide full protection to the Rice's whale, which has been documented to occur in waters as shallow as 117 m, although the majority of sightings have occurred in waters deeper than 200 m.

To prevent any PTS impacts to the Rice's whale from gunnery operations, NMFS has mandated that all gunnery missions must be conducted at least 500 m landward of the 100-m isobath instead of landward of the 200-m isobath as was originally proposed by the USAF. This setback distance from the 100-m isobath is based on the modeled PTS threshold distance for daytime gunnery missions (mission-day G) of 494 m (Table 28). At this setback distance, potential PTS effects from daytime gunnery missions would not extend into Rice's whale habitat, as defined by the 100-m isobath. The PTS Level A harassment isopleth of a nighttime gunnery mission, which is 401 m in radius, is contained farther landward of the habitat boundary.

Another mitigation measure to prevent any PTS (or more severe) impacts to the Rice's whale will restrict the use of all live munitions in the western part of the existing LIA and East LIA based on the setbacks from the 100-m isobaths. The setback distances determined for the mission-day categories are presented in Table 32 and are shown for the existing LIA and East LIA on Figures 6-5 and 6-6, respectively. For example, the subsurface detonation of a GBU-10, GBU-24, or GBU-31, each of which have a NEW of 945 lb (428.5 kg), would represent the most powerful single detonation that would be conducted under the USAF's planned activities. Such a detonation would correspond to mission-day category J. To prevent any PTS impacts to the Rice's whale, a mission that would involve such a single subsurface detonation would be conducted in a portion of the LIA that is behind the setback identified for mission-day category J.

Likewise, a mission that would involve multiple detonations that have a total cumulative NEW<sub>i</sub> comparable to that of mission-day category A would be conducted behind the setback identified for mission-day category A. Each user group will use the mission-day categories and corresponding setback distances to determine the setback distance that is appropriate for their actual mission. The user group will estimate the NEW<sub>i</sub> of the actual mission to identify which mission-day category and associated setback to use. The energy of the actual mission must be less than the energy of the mission-day category in terms of total NEW<sub>i</sub> and largest single-munition NEW<sub>i</sub> to ensure that the energy and effects of the actual mission will not exceed the energy and effects estimated for the corresponding mission-day category.

#### Rice's Whale Habitat Area Prohibitions

This section identifies areas where firing of live or inert munitions is prohibited to limit impacts to Rice's whales. The USAF will prohibit the use of live or inert munitions in Rice's whale habitat during the effective period for the issued LOA. Under this new mitigation measure, all munitions use will be prohibited between the 100-m and 400-m isobaths which represents the area where most Rice's whale detections have occurred. Live munitions under mission-day

category K would be permitted to be fired into the existing LIA or East LIA but must have a setback of 1.338 km from the 100-m isobath while inert munitions under mission-day category K could be fired into portions of the EGTTR outside the LIAs. However, they would need to be outside the area between the 100-m and 400-m isobaths.

Overall, the USAF has agreed to procedural mitigation measures that would reduce the probability and/or severity of impacts expected to result from acute exposure to live explosives and inert munitions and impacts to marine mammal habitat.

#### Gunnery-specific Mitigation

Additional mitigation measures are applicable only to gunnery missions. The USAF must use 105 mm Training Rounds (TR; NEW of 0.35 lb (0.16 kg)) for nighttime missions. These rounds contain less explosive material content than the 105 mm Full Up (FU; NEW of 4.7 lb (2.16 kg)) rounds that are used during the day. Therefore, the harassment zones associated with the 105 mm TR are smaller and can be more effectively monitored compared to the daytime zones. Ramp-up procedures will also be required for day and night gunnery missions which must begin firing with the smallest round and proceed to increasingly larger rounds. The purpose of this measure is to expose the marine environment to steadily increasing noise levels with the intent that marine animals will move away from the area before noise levels increase. During each gunnery training mission, gun firing can last up to 90 minutes but typically lasts approximately 30 minutes. Live firing is continuous, with pauses usually lasting well under 1 minute and rarely up to 5 minutes. Aircrews must reinitiate protected species surveys if gunnery firing pauses last longer than 10 minutes.

Protected species monitoring procedures for CV-22 gunnery training are similar to those described for AC-130 gunnery training, except that CV-22 aircraft typically operate at much lower altitudes than AC-130 gunships. If protected marine species are detected during pre-mission surveys or during the mission, operations will be immediately halted until the monitoring zone is clear of all animals, or the mission will be relocated to another target area. If

the mission is relocated, the pre-mission survey procedures will be repeated in the new area. If multiple gunnery missions are conducted during the same flight, marine species monitoring will be conducted separately for each mission. Following each mission, aircrews will conduct a post-mission survey beginning at the operational altitude and continuing through an orbiting descent to the designated monitoring altitude.

All gunnery missions must monitor a set distance depending on the aircraft type as shown in Table 37. Pre-mission aerial surveys conducted by gunnery aircrews in AC-130s extend out 5 nmi (9,260 m) while CV-22 aircraft would have a monitoring range of 3 nmi (5,556 m). The modeled distances for behavioral disturbance for gunnery daytime and nighttime missions are 12.9 km and 7.1 km, respectively. The behavioral disturbance zone is smaller at night due to the required use of less impactful training rounds (105-mm TR). Therefore, the aircrews are able to survey all of the behavioral disturbance for a nighttime gunnery mission but not for a daytime gunnery mission. The size of the monitoring areas are based on the monitoring and operational altitudes of each aircraft as well as previously established aircraft safety profiles.

**Table 37--Monitoring Areas and Altitudes for Gunnery Missions**

Aircraft	Gunnery Round	Monitoring Area	Monitoring Altitude	Operational Altitude
AC-30 Gunship	30 mm; 105 mm (FU and TR)	5 nmi (9,260 m)	6,000 feet (1,828 m)	15,000 to 20,000 feet (4572 – 6096 m)
CV-22 Osprey	.50 caliber	3 nmi (5,556 m)	1,000 feet (305 m)	1,000 feet (305 m)

Other than gunnery training, mission-day category K tests are the only other EGTTR missions currently planned to be conducted at nighttime during the 2023–2030 period. Mission-day category K tests and any other missions that are actually conducted at nighttime during the mission period will be required to be supported by AC-130 aircraft with night-vision instrumentation or other platforms with comparable nighttime monitoring capabilities. For mission-day category K missions, the pre-mission survey area will extend out to, at a minimum,

double the Level A harassment (PTS) threshold distance that applies to both dolphin species for mission-day category K test. A mission-day category K test would correspond to mission-day category K, which is estimated to have a PTS threshold distance of 0.445 km. Therefore, the pre-mission survey for a mission-day category K test would extend out to 0.89 km, at a minimum.

#### Environmental Conditions

*Sea State Conditions* - Appropriate sea state conditions must exist for protected species monitoring to be effective. Wind speed and the associated roughness of the sea surface are key factors that influence the efficacy of PSO monitoring. Strong winds increase wave height and create whitecaps, both of which limit a PSO's ability to visually detect marine species at or near the surface. The sea state scale used for EGTTTR pre-mission protected species surveys is presented in Table 38. All missions will be postponed or rescheduled if conditions exceed sea state 4, which is defined as moderate breeze, breaking crests, numerous white caps, wind speed of 11 to 16 knots, and wave height of 3.3 to 6 ft (1.0 to 1.8 m). PSOs will determine whether sea conditions are suitable for protective species monitoring.

**Table 38--Sea State Scale Used for EGTTTR Pre-Mission Protected Species Surveys**

Sea State Number	Sea Conditions
0	Flat, calm, no waves or ripples
1	Light air, winds 1 to 2 knots; wave height to 1 foot; ripples without crests
2	Light breeze, winds 3 to 6 knots; wave height 1 to 2 feet; small wavelets, crests not breaking
3	Gentle breeze, winds 7 to 10 knots; wave height 2 to 3.5 feet; large wavelets, scattered whitecaps
4	Moderate breeze, winds 11 to 16 knots; wave height 3.5 to 6 feet; breaking crests, numerous whitecaps
5	Strong breeze, winds 17 to 21 knots; wave height 6 to 10 feet; large waves, spray possible

*Daylight Restrictions* - Daylight and visibility restrictions are also implemented to ensure the effectiveness of protected species monitoring. All live missions except for nighttime gunnery and hypersonic weapon missions will occur no earlier than 2 hours after sunrise and no later than 2 hours before sunset to ensure adequate daylight for pre- and post-mission monitoring.

## *Mitigation Conclusions*

NMFS has carefully evaluated the USAF's planned mitigation measures, as well as other potential mitigation measures suggested during the public comment period, which are discussed in our responses to public comments. Our evaluation of potential measures included consideration of the following factors in relation to one another: the manner in which, and the degree to which, the successful implementation of the mitigation measures is expected to reduce the likelihood and/or magnitude of adverse impacts to marine mammal species and their habitat; the proven or likely efficacy of the measures; and the practicability of the measures for applicant implementation, including consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Based on our evaluation, NMFS has determined that USAF's planned measures, including pre-mission surveys; mission postponements or cancellations if animals are observed in the mitigation or monitoring zones; Rice's whale setbacks; Rice's whale habitat prohibitions; gunnery-specific measures; and environmental measures, are the appropriate means of effecting the least practicable adverse impact on the marine mammal species and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and considering specifically personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity. Additionally, an adaptive management provision ensures that mitigation is regularly assessed and provides a mechanism to improve the mitigation, based on the factors above, through modification as appropriate.

## **Monitoring and Reporting Requirements**

In order to issue an incidental harassment authorization (IHA) for an activity, section 101(a)(5)(A) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of

the species and of the level of taking or impacts on populations of marine mammals that are expected to be present while conducting the activities. Effective reporting is critical both to compliance as well as to ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the activity; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and,
- Mitigation and monitoring effectiveness.

The USAF will require training for all PSOs who will utilize vessel-based, aerial-based, video-based platforms or some combination of these approaches depending on the requirements of the mission type as shown in Table 39. Specific PSO training requirements are described below.

### *PSO Training*

All personnel who conduct protected species monitoring are required to complete Eglin AFB's Marine Species Observer Training Course, which was developed in consultation with NMFS. The required PSO training covers applicable environmental laws and regulations, consequences of non-compliance, PSO roles and responsibilities, photographs and descriptions of protected species and indicators, survey methods, monitoring requirements, and reporting procedures. Any person who will serve as a PSO for a particular mission must have completed the training within a year prior to the mission. For missions that require multiple survey platforms to cover a large area, a Lead Biologist is designated to lead the monitoring and coordinate sighting information with the Eglin AFB Test Director (Test Director) or the Eglin AFB Safety Officer (Safety Officer).

Note that all three monitoring platforms described in Table 39 are not needed for all missions. The use of the platforms for a given mission are evaluated based on mission logistics, public safety, and the effectiveness of the platform to monitor for protected species. Vessel and video monitoring are almost always used but aerial monitoring may not be used for some missions because it is not needed in addition to the vessel-based surveys that are conducted. Aerial monitoring is considered to be supplemental to vessel-based monitoring and is used only when needed, for example if not enough vessels are available or to provide coverage in areas farther offshore where using vessels may be more logistically difficult. Note that at least one of the monitoring platforms described in Table 39 must be used for every mission. In most instances, two or three of the monitoring platforms will be employed.

**Table 39--Monitoring Options Required to the Extent Practicable and Locations for Live Air-to-Surface Mission Proponents Operating in the EGTTR**

User Group	Mission-Day Category	Munition Type	Monitoring Platform			Location		
			Aerial-Based	Vessel-Based	Video-Based	LIA	East LIA	Outside LIAs
53 WEG	A	Missile	x	x	x	x	x	

	B	Missile, Bomb	x	x	x	x	x	
	C	Missile	x	x	x	x	x	
	D	Missile	x	x	x	x	x	
	E	Missile, Bomb, Rocket, Gun Ammunition	x	x	x	x	x	
AFSOC	F	Bomb	x	x	x	x	x	
	G	Gun Ammunition	x			x	x	x
	H	Gun Ammunition	x			x	x	x
	I	Rockets	x	x	x	x	x	
96 OG	J	Bomb	x	x	x	x	x	
	K	Hypersonic	x	x	x	x	x	
	L	Missile, Bomb	x	x	x	x	x	
	M	Bomb	x	x	x	x	x	
	N	Missile, Bomb	x	x	x	x	x	
	O	Missile	x	x	x	x	x	
	P	Missile	x	x	x	x	x	
	Q	Gun Ammunition	x			x	x	
NAVSCOLE D	R	Bomb, Gun Ammunition	x			x	x	
	S	Charge		x		x	x	x

### *Monitoring Platforms*

#### Vessel-based Monitoring

Pre-mission surveys conducted from vessels will typically begin at sunrise. Vessel-based monitoring is required for all mission-day categories except for gunnery missions. Trained marine species PSOs will use dedicated vessels to monitor for protected marine species and potential indicators during the pre-mission surveys. For missions that require multiple vessels to cover a large survey area, a Lead Biologist will be designated to coordinate all survey efforts, compile sighting information from the other vessels, serve as the point of contact between the

survey vessels and Tower Control, and provide final recommendations to the Safety Officer/Test Director on the suitability of the mission site based on environmental conditions and survey results.

Survey vessels will run predetermined line transects, or survey routes, that will provide sufficient coverage of the survey area. Monitoring will be conducted from the highest point feasible on the vessels. There will be at least two PSOs on each vessel, and they will each use professional-grade binoculars.

All sighting information from pre-mission surveys will be communicated to the Lead Biologist on a predetermined radio channel to reduce overall radio chatter and potential confusion. After compiling all the sighting information from the other survey vessels, the Lead Biologist will inform Tower Control if the survey area is clear or not clear of protected species. If the area is not clear, the Lead Biologist will provide recommendations on whether the mission should be postponed or canceled. For example, a mission postponement would be recommended if a protected species is in the mitigation zone but appears to be heading away from the mission area. The postponement would continue until the Lead Biologist has confirmed that the animals are no longer in the mitigation zone and are swimming away from the range. A mission cancellation could be recommended if one or more protected species are sighted in the mitigation zones and there is no indication that they would leave the area within a reasonable time frame. Tower Control will relay the Lead Biologist's recommendation to the Safety Officer. The Safety Officer and Test Director will collaborate regarding range conditions based on the information provided. Ultimately, the Safety Officer will have final authority on decisions regarding postponements and cancellations of missions.

#### Human Safety Zone Monitoring

Established range clearance procedures are followed during all EGTR missions for public safety. Prior to each mission, a human safety zone appropriate for the mission is established around the target area. The size of the human safety zone varies depending on the

munition type and delivery method. A composite safety zone is often developed for missions that involve multiple munition types and delivery methods. A typical composite safety zone is octagon-shaped to make it easier to monitor by range clearing boats and easier to interpret by the public when it is overlaid on maps with latitude and longitude coordinates. The perimeter of a composite safety zone may extend out to approximately 15 miles (13 nmi) from the center of the zone and may be monitored by up to 25 range-clearing boats to ensure it is free of any non-participating vessels before and during the mission.

#### *Air Force Support Vessels*

USAF support vessels will be operated by a combination of USAF and civil service/civilian personnel responsible for mission site/target setup and range-clearing activities. For each mission, USAF personnel will be within the mission area (on boats and the GRATV) well in advance of initial munitions use, typically around sunrise. While in the mission area, they will perform a variety of tasks, such as target preparation and equipment checks, and will also observe for marine mammals and indicators when possible. Any sightings would be relayed to the Lead Biologist.

The Safety Officer, in cooperation with the CCF (Central Control Facility) and Tower Control, will coordinate and manage all range-clearing efforts and will be in direct communication with the survey vessel team, typically through the Lead Biologist. All support vessels will be in radio contact with each other and with Tower Control. The Safety Officer will monitor all radio communications, and Tower Control will relay messages between the vessels and the Safety Officer. The Safety Officer and Tower Control will also be in constant contact with the Test Director throughout the mission to convey information on range clearance and marine species surveys. Final decisions regarding mission execution, including possible mission postponement or cancellation based on marine species sightings or civilian boat traffic, will be the responsibility of the Safety Officer, with concurrence from the Test Director.

#### *Aerial-Based Monitoring*

Aircraft provide an excellent viewing platform for detecting marine mammals at or near the sea surface. Depending on the mission, the aerial survey team will consist of Eglin AFB Natural Resources Office personnel or their designees aboard a non-mission aircraft or the mission aircrew who have completed the PSO training. The Eglin AFB Natural Resources Office has overall responsibility for implementing the natural resources management program and is the lead organization for monitoring compliance with applicable Federal, State, and local regulations. It reports to the installation command, the 96<sup>th</sup> Test Wing, via the Environmental Management Branch of the 96<sup>th</sup> Civil Engineer Group. All mission-day categories require aerial-based monitoring, assuming assets are available and when such monitoring does not interfere with testing and training parameters required by mission proponents. Note that gunnery mission aircraft must also serve as aerial-based monitoring platforms.

For non-mission aircraft, the pilot will be instructed on marine species survey techniques and will be familiar with the protected species expected to occur in the area. One PSO in the aircraft will record data and relay information on species sightings, including the species (if possible), location, direction of movement, and number of animals, to the Lead Biologist. The aerial team will also look for potential indicators of protected species presence, such as large schools of fish and large, active groups of birds. Pilots will fly the aircraft so that the entire mitigation and monitoring zones (and a buffer, if required) are monitored. Marine species sightings from the aerial survey team will be compiled by the Lead Biologist and communicated to the Test Director or Safety Officer. Monitoring by non-mission aircraft would be conducted only for certain missions, when the use of such aircraft is practicable based on other mission-related factors.

Some mission aircraft have the capability to conduct aerial surveys for marine species immediately prior to releasing munitions. Mission aircraft used to conduct aerial surveys will be operated at reasonable and safe altitudes appropriate for visually scanning the sea surface and/or using onboard instrumentation to detect protected species. The primary mission aircraft that

conduct aerial surveys for marine species are the AC-130 gunship and CV-22 Osprey used for gunnery operations.

AC-130 gunnery training involves the use of 30 mm and 105 mm FU rounds during daytime and 30 mm and 105 mm TRs during nighttime. The TR variant (0.35 lb (0.15 kg) NEW) of the 105 mm HE round has less explosive material than the FU round (4.7 lb (2.13 kg) NEW). AC-130s are equipped with and required to use low-light electro-optical and infrared sensor systems that provide excellent night vision. Gunnery missions use the 105 mm TRs during nighttime missions as an additional mitigation measure for protected marine species. If a towed target is used, mission personnel will maintain the target in the center portion of the survey area to ensure gunnery impacts do not extend past the predetermined mitigation and monitoring zones. During the low-altitude orbits and climb, the aircrew will visually scan the sea surface for the presence of protected marine species. The visual survey will be conducted by the flight crew in the cockpit and personnel stationed in the tail observer bubble and starboard viewing window.

After arriving at the mission site and before initiating gun firing, the aircraft would be required to fly at least two complete orbits around the target area out to the applicable monitoring zone at a minimum safe airspeed and appropriate monitoring altitude. If no protected species or indicators are detected, the aircraft will then ascend to an operational altitude while continuing to orbit the target area as it climbs. The initial orbits typically last approximately 10 to 15 minutes. Monitoring for marine species and non-participating vessels continues throughout the mission. When aerial monitoring is conducted by aircraft, a minimum ceiling of 305 m (1,000 feet) and visibility of 5.6 km (3 nmi) are required for effective monitoring efforts and flight safety.

Infrared systems are equally effective during day or night. Nighttime missions would be conducted by AC-130s that have been upgraded recently with MX-25D sensor systems, which provide superior night-vision capabilities relative to earlier sensor systems. CV-22 training involves the use of only .50 caliber rounds, which do not contain explosive material and,

therefore, do not detonate. Aircrews will conduct visual and instrumentation-based scans during the post-mission survey as described for the pre-mission survey.

### Video-Based Monitoring

Video-based monitoring is conducted via transmission of live, high-definition video feeds from the GRATV at the mission site to the CCF and is required on all mission-day categories except for gunnery missions. These video feeds can be used to remotely view the mission site to evaluate environmental conditions and monitor for marine species up to the time munitions are used. There are multiple sources of video that can be streamed to multiple monitors within the CCF. A PSO from Eglin Natural Resources will monitor the live video feeds transmitted to the CCF when practicable and will report any protected marine species sightings to the Safety Officer, who will also be at the CCF. Video monitoring can mitigate the lapse in time between the end of the pre-mission survey and the beginning of the mission.

Four video cameras are typically operated on the GRATV for real-time monitoring and data collection during the mission. All cameras have a zoom capability of up to at least a 300 mm equivalent. The cameras allow video PSOs to detect an item as small as 1 square foot (0.09 square m) up to 4,000 m away.

Supplemental video monitoring must be used when practicable via additional aerial assets. Aerial assets with video monitoring capabilities include Eglin AFB's aerostat balloon and unmanned aerial vehicles (UAVs). These aerial assets support certain missions, for example by providing video of munition detonations and impacts; these assets are not used during all missions. The video feeds from these aerial assets can be used to monitor protected species; however, they would always be a supplemental form of monitoring that would be used only when available and practicable. Eglin AFB's aerostat balloon provides aerial imagery of weapon impacts and instrumentation relay. When used, it is tethered to a boat anchored near the GRATV. The balloon can be deployed to an altitude of up to 2,000 ft (607 m). It is equipped with a high-definition camera system that is remotely controlled to pivot and focus on a specific target or

location within the mission site. The video feed from the camera system is transmitted to the CCF. Eglin AFB may also employ other assets such as intelligence, surveillance, and reconnaissance aircraft to provide real-time imagery or relay targeting pod videos from mission aircraft. UAVs may also be employed to provide aerial video surveillance. While each of these platforms may not be available for all missions, they typically can be used in combination with each other and with the GRATV cameras to supplement overall monitoring efforts. Even with a variety of platforms potentially available to supply video feeds to the CCF, the entirety of the mitigation and monitoring zones may not be visible for the entire duration of the mission. The targets and immediate surrounding areas will typically be in the field of view of the GRATV cameras, which will allow the PSO to detect any protected species that may enter the target area before weapon releases. The cameras also allow the PSO to readily inspect the target area for any signs that animals were injured. If a protected marine species is detected on the live video, the weapon release can be stopped almost immediately because the video camera PSO is in direct contact with Test Director and Safety Officer at the CCF.

The video camera PSO will have open lines of communication with the PSOs on vessels to facilitate real-time reporting of marine species sightings and other relevant information, such as the presence of non-participating vessels near the human safety zone. Direct radio communication will be maintained between vessels, GRATV personnel, and Tower Control throughout the mission. The Safety Officer will monitor all radio communications from the CCF, and information between the Safety Officer and support vessels will be relayed via Tower Control.

#### *Post-Mission Monitoring*

During post-mission monitoring, PSOs would survey the mission site for any dead or injured marine mammals. Vessels will move into the survey area from outside the safety zone and monitor for at least 30 minutes, concentrating on the area down current of the test site. The duration of post-mission surveys is based on the survey platforms used and any potential time

lapse between the last detonation and the beginning of the post-mission survey. This lapse typically occurs when survey vessels stationed on the perimeter of the human safety zone are required to wait until the range has been declared clear before they can begin the survey. Up to 10 USAF support vessels will spend several hours in this area collecting debris from damaged targets.

All vessels will report any dead or injured marine mammals to the Lead Biologist. All marine mammal sightings during post-mission surveys are documented on report forms that are submitted to the Eglin Natural Resources Office after the mission. The post-mission survey area will be the area covered in 30 minutes of observation in a direction down-current from impact site or the actual pre-mission survey area, whichever is reached first.

For gunnery missions, aircrews must conduct post-mission surveys beginning at the operational altitude and continuing through an orbiting descent to the designated monitoring altitude. The descent will typically last approximately 3 to 5 minutes. The post-mission survey area will be the area covered in 30 minutes of observation in a direction down-current from impact site or the actual pre-mission survey area, whichever is reached first. Aircrews will conduct visual and instrumentation-based scans during the post-mission survey as described for the pre-mission survey.

As agreed upon between the USAF and NMFS, the required mitigation monitoring measures presented in the **Mitigation** requirements section focus on the protection and management of potentially affected marine mammals. A well-designed monitoring program can provide important feedback for validating assumptions made in analyses and allow for adaptive management of marine resources.

#### *Acoustic Monitoring*

The USAF will conduct two NMFS-approved PAM studies, pending the availability of funding, as previously described in the response to comment 4. As a condition of the 2018-2023 regulations and associated LOA, NMFS required the USAF to: (1) conduct a PAM study as an

initial step toward understanding acoustic impacts of underwater detonations, if funding was approved, and (2) conduct a follow-up PAM study to investigate marine mammal vocalizations before, during and after live missions in the EGTTR. The USAF did conduct the PAM study on underwater detonations which was the first of the two-part condition of the 2018-2023 LOA (Leidos 2020). The study determined that inert underwater detonations were generally louder than expected. As a result of these findings, the USAF included analyses of impacts of inert munitions in the LOA application and NMFS is requiring appropriate mitigation measures for inert munitions. Funding was not obtained to commence the second part of the study.

The Marine Mammal Commission recommended as part of this final rule and LOA that NMFS require the USAF to prioritize (1) completing the follow-up study to the original PAM study which is described above and (2) further investigate ways to supplement its mitigation measures with the use of real-time PAM devices (i.e., sonobuoys or hydrophones) of any final rule issued, similar to the previous final rule. NMFS concurred with these recommendations. Both of these actions are contingent upon the availability of funding and both studies must be approved by NMFS.

#### *Adaptive Management*

NMFS may modify (including augment) the existing mitigation, monitoring, or reporting measures (after consulting with Eglin AFB regarding the practicability of the modifications) if doing so creates a reasonable likelihood of more effectively accomplishing the goals of the mitigation and monitoring measures for these regulations.

Possible sources of data that could contribute to the decision to modify the mitigation, monitoring, or reporting measures in an LOA include: (1) Results from Eglin AFB's acoustic monitoring study; (2) results from monitoring during previous year(s); (3) results from other marine mammal and/or sound research or studies; and (4) any information that reveals marine mammals may have been taken in a manner, extent or number not authorized by these regulations or subsequent LOAs.

If, through adaptive management, the modifications to the mitigation, monitoring, or reporting measures are substantial, NMFS will publish a notice of proposed LOA in the **Federal Register** and solicit public comment. If, however, NMFS determines that an emergency exists that poses a significant risk to the well-being of the species or stocks of marine mammals in the Gulf of Mexico, an LOA may be modified without prior notice or opportunity for public comment. Notice would be published in the **Federal Register** within 30 days of the action.

#### *Reporting Requirements*

Section 101(a)(5)(A) of the MMPA states that, in order to issue incidental take authorization for an activity, NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. Effective reporting is critical both to compliance as well as to ensuring that the most value is obtained from the required monitoring.

A summary annual report of marine mammal observations and mission activities must be submitted to the NMFS Southeast Regional Office and the NMFS Office of Protected Resources 90 days after completion of mission activities each year. A final report shall be prepared and submitted within 30 days following resolution of comments on the draft report from NMFS. This annual report must include the following information:

- Date, time and location of each mission including mission-day category, general munition type, and specific munitions used;
- Complete description of the pre-mission and post-mission monitoring activities including type and location of monitoring platforms utilized (*i.e.*, vessel-, aerial or video-based);
- Summary of mitigation measures employed including postponements, relocations, or cancellations of mission activity;
- Number, species, and any other relevant information regarding marine mammals observed and estimated exposed/taken during activities;
- Description of the observed behaviors (in both presence and absence of test activities);

- Environmental conditions when observations were made, including visibility, air temperature, clouds, wind speed, and swell height and direction;
- Assessment of the implementation and effectiveness of mitigation and monitoring measures; and
- PSO observation results as provided through the use of PSO report forms.

A Final Comprehensive Report summarizing monitoring and mitigation activities over the 7-year LOA effective period must be submitted 90 days after the completion of mission activities at the end of year 7.

If a dead or seriously injured marine mammal is found during post-mission monitoring, the incident must be reported to the NMFS Office of Protected Resources, NMFS Southeast Region Marine Mammal Stranding Network, and the Florida Marine Mammal Stranding Network. In the unanticipated event that any cases of marine mammal mortality are judged to result from missions in the EGTTR at any time during the period covered by the LOA, this will be reported to NMFS Office of Protected Resources and the National Marine Fisheries Service's Southeast Regional Administrator. The report must include the following information:

1. Time and date of the incident;
2. Description of the incident;
3. Environmental conditions (*e.g.*, wind speed and direction, cloud cover, and visibility);
4. Species identification or description of the animal(s) involved;
5. Fate of the animal(s); and
6. Photographs or video footage of the animal(s).

Mission activities must not resume in the EGTTR until NMFS is able to review the circumstances of the prohibited take. If it is determined that the unauthorized take was caused by mission activities, NMFS will work with the USAF to determine what measures are necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The USAF may not resume their activities until notified by NMFS.

### *Past Monitoring Results in the EGTTR*

Eglin AFB has submitted to NMFS annual reports that summarize the results of protected species surveys conducted for EGTTR missions. From 2010 to 2021, Eglin AFB conducted 67 gunnery missions in the EGTTR. To date, there has been no evidence that marine mammals have been impacted from gunnery operations conducted in the EGTTR. The use of instrumentation on the AC-130 and CV-22 in pre-mission surveys has proven effective to ensure the mission site is clear of protected species prior to gun firing. Monitoring altitudes during pre-mission surveys for both the AC-130 and CV-22 are much lower than 15,000 ft (4,572 m); therefore, the instrumentation on these aircraft would be even more effective at detecting marine species than indicated by photographs. From 2013 to 2020, Eglin AFB conducted 25 live missions collectively under 53 WEG programs in the EGTTR. From 2016-2021, Eglin AFB conducted 16 live bomb missions in the EGTTR. Protected species monitoring for these past missions was conducted using a combination of vessel-based surveys and live video monitoring from the CCF, as described. Pre-mission survey areas for 53 WEG missions were based on mission-day categories developed per NMFS's request to account for the accumulated energy from multiple detonations. Note that surveys conducted for the earlier Maritime Strike missions were based on thresholds determined for single detonations; however, these 53 WEG missions involved detonations of larger munitions. There has been no evidence of mortality, injury, or any other detectable adverse impact to any marine mammal from the 53 WEG missions conducted to date. Dolphins were sighted within the mitigation zone prior to ordnance delivery during some of these past missions. In these cases, the mission was postponed until the animals were confirmed to be outside the mitigation zone. Although monitoring during and following munitions use is limited to observable impacts within and in the vicinity of the mission area, the lack of any past evidence of any associated impacts on marine mammals is an indication that the monitoring and mitigation measures implemented for EGTTR operations are effective.

Eglin AFB submitted annual reports required under the existing LOA from 2018-2021. Although marine mammals were sighted on a number of mission days, usually during pre-and post-mission surveys, Eglin AFB concluded that no marine mammal takes occurred as a result of any mission activities from 2018-2021. The annual monitoring reports are available at: <https://www.fisheries.noaa.gov/action/incidental-take-authorization-us-air-force-testing-and-training-activities-eglin-gulf-test>.

### **Analysis and Negligible Impact Determination**

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (*i.e.*, population-level effects) (50 CFR 216.103). An estimate of the number of takes alone is not enough information on which to base an impact determination. In considering how Level A harassment or Level B harassment factor into the negligible impact analysis, in addition to considering the number of estimated takes, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338, September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known).

In the **Estimated Take of Marine Mammals** section of this final rule, we identified the subset of potential effects that are reasonably expected to occur and rise to the level of takes based on the methods described. The impact that any given take will have on an individual, and ultimately the species or stock, is dependent on many case-specific factors that need to be considered in the negligible impact analysis (*e.g.*, the context of behavioral exposures such as duration or intensity of a disturbance, the health of impacted animals, the status of a species that

incurs fitness-level impacts to individuals, *etc.*). For this final rule, we evaluated the likely impacts of the number of harassment takes reasonably expected to occur, and authorized for take, in the context of the specific circumstances surrounding these predicted takes. Last, we collectively evaluated this information, as well as other more taxa-specific information and mitigation measure effectiveness, to support our negligible impact conclusions for each species and stock.

As explained in the **Estimated Take of Marine Mammals** section, no take by serious injury or mortality is anticipated or authorized. Further, any Level A harassment would be expected to be in the form of PTS; no non-auditory injury is anticipated or authorized.

The Specified Activities reflect maximum levels of training and testing activities. The **Description of the Specified Activity** section describes annual activities. There may be some flexibility in the exact number of missions that may vary from year to year, but take totals will not exceed the maximum annual numbers or the 7-year totals indicated in Table 34. We base our analysis and negligible impact determination on the maximum number of takes that are reasonably expected to occur and that are authorized, although, as stated before, the number of takes are only a part of the analysis, which includes qualitative consideration of other contextual factors that influence the degree of impact of the takes on the affected individuals. To avoid repetition, in this **Analysis and Negligible Impact Determination** section we provide some general analysis that applies to all the species and stocks listed in Table 34, given that some of the anticipated effects of the USAF's training and testing activities on marine mammals are expected to be relatively similar in nature. Next, we break up our analysis by species and stock, to provide more specific information related to the anticipated effects on individuals of that species and to discuss where there is information about the status or structure of any species that would lead to a differing assessment of the effects on the species.

The USAF's take request, which, as described above, is for harassment only, is based on its acoustic effects model. The model calculates sound energy propagation from explosive and

inert munitions during training and testing activities in the EGTTTR. The munitions planned to be used by each military unit were grouped into mission-day categories so the acoustic impact analysis could be based on the total number of detonations conducted during a given mission to account for the accumulated energy from multiple detonations over a 24-hour period. A total of 19 mission-day categories were developed for the munitions planned to be used. Using the dBSea underwater acoustic model and associated analyses, the threshold distances and harassment zones were estimated for each mission-day category for each marine mammal species. Takes were estimated based on the area of the harassment zones, predicted animal density, and annual number of events for each mission-day category. To assess the potential impacts of inert munitions on marine mammals, the planned inert munitions were categorized into four classes based on their impact energies, and the threshold distances for each class were modeled and calculated as described for the mission-day categories. Assumptions in the USAF model intentionally err on the side of overestimation. For example, the model conservatively assumes that 1) the water surface is flat (no waves) to allow for maximum energy reflectivity; 2) munitions striking targets confer all weapon energy into underwater acoustic energy; and 3) above or at surface explosions assume no energy losses from surface effects (*e.g.*, venting which dissipates energy through the ejection of water and release of detonation gasses into the atmosphere).

Generally speaking, the USAF and NMFS anticipate more severe effects from takes resulting from exposure to higher received levels (though this is in no way a strictly linear relationship for behavioral effects throughout species, individuals, or circumstances) and less severe effects from takes resulting from exposure to lower received levels. However, there is also growing evidence of the importance of distance in predicting marine mammal behavioral response to sound – *i.e.*, sounds of a similar level emanating from a more distant source have been shown to be less likely to evoke a response of equal magnitude (DeRuiter 2012, Falcone *et al.* 2017). The estimated number of Level A harassment and Level B harassment takes does not

necessarily equate to the number of individual animals the USAF expects to harass (which is likely slightly lower). Rather, the estimates are for the instances of take (*i.e.*, exposures above the Level A harassment and Level B harassment threshold) that are anticipated to occur annually and over the 7-year period. Some of the enumerated instances of exposure could potentially represent exposures of the same individual marine mammal on different days, meaning that the number of individuals taken is less than the number of instances of take, but the nature of the activities in this rule (*e.g.*, short duration, intermittent) and the distribution and behavior of marine mammals in the area do not suggest that any single marine mammal would likely be taken on more than a few days within a year.

Explosive events may be a single event involving one explosion (single exposure) or a series of intermittent explosives (multiple explosives) occurring over the course of a day. Gunnery events, in some cases, may have longer durations of exposure to intermittent sound. In general, gunnery events can last intermittently up to 90 minutes total, but typically lasts approximately 30 minutes. Live firing is continuous, with pauses usually lasting well under 1 minute and rarely up to 5 minutes. Takes may represent either brief exposures (seconds) or, slightly longer exposures, or, in some cases, multiple brief exposures, within a day. Most explosives detonating at or near the surface have brief exposures lasting only a few milliseconds to minutes for the entire event.

### *Behavioral Disturbance*

Behavioral reactions from explosive sounds are likely to be similar to reactions studied for other impulsive sounds such as those produced by air guns. Impulsive signals, particularly at close range, have a rapid rise time and higher instantaneous peak pressure than other signal types, making them more likely to cause startle responses or avoidance responses. Most data has come from seismic surveys that occur over long durations (*e.g.*, on the order of days to weeks), and typically utilize large multi-air gun arrays that fire repeatedly. While seismic air gun data provides the best available science for assessing behavioral responses to impulsive sounds (*i.e.*,

sounds from explosives) by marine mammals, it is likely that these responses represent a worst-case scenario compared to most USAF explosive noise sources, because the overall duration of exposure to a seismic airgun survey would be expected to be significantly longer than the exposure to sounds from any exercise using explosives, given the typical duration and impact zones of seismic airguns as compared to the majority of the detonations contemplated for this action.

Take estimates alone do not provide information regarding the potential fitness or other biological consequences of the reactions on the affected individuals. NMFS therefore considers the available activity-specific, environmental, and species-specific information to determine the likely nature of the behavioral disturbances and the potential fitness consequences for affected individuals.

In the range of potential behavioral effects that might be expected to be part of a response that qualifies as an instance of Level B harassment by behavioral disturbance (which by nature of the way it is modeled/counted, occurs within one day), the less severe end might include exposure to comparatively lower levels of a sound, at a detectably greater distance from the animal, for a few or several minutes. A less severe exposure of this nature could result in a behavioral response such as avoiding an area that an animal would otherwise have chosen to move through or feed in for some amount of time or breaking off one or a few feeding bouts. More severe effects could occur when the animal gets close enough to the source to receive a comparatively higher level, or is exposed intermittently to different sources throughout a day. Such effects might result in an animal having a more severe flight response and leaving a larger area for a day or more or potentially losing feeding opportunities for a day. However, such severe behavioral effects are expected to occur infrequently since monitoring and mitigation requirements would limit exposures to marine mammals. Additionally, previous marine mammal monitoring efforts in the EGTTTR over a number of years have not demonstrated any impacts on marine mammals.

The majority of Level B harassment takes are expected to be in the form of milder responses (*i.e.*, lower-level exposures that still rise to the level of take) of a generally shorter duration due to lower received levels that would occur at greater distances from the detonation site due to required monitoring and mitigation efforts. For example, the largest munitions (*e.g.* mission-day category A with 2,413 lb (1,094.6 kg) NEWi) feature up to 10 intermittent explosions over several hours. However, it is likely that animals would not be present in the PTS or TTS zones due to mitigation efforts, and this activity would occur on only a single day per year. Gunnery missions may last continuously up to 90 minutes, but most will be less than 30 minutes and the NEWi of such missions (*i.e.*, 191.6 to 61.1 lb (86.9 to 27.7 kg)) are relatively small. We anticipate more severe effects from takes when animals are exposed to higher received levels or at closer proximity to the source. However, depending on the context of an exposure (*e.g.*, depth, distance, if an animal is engaged in important behavior such as feeding), a behavioral response can vary across species and individuals within a species. Specifically, given a range of behavioral responses that may be classified as Level B harassment, to the degree that higher received levels are expected to result in more severe behavioral responses, only a smaller percentage of the anticipated Level B harassment from USAF activities would be expected to potentially result in more severe responses. To fully understand the likely impacts of the predicted/authorized take on an individual (*i.e.*, what is the likelihood or degree of fitness impacts), one must look closely at the available contextual information presented above, such as the duration of likely exposures and the likely severity of the exposures (*e.g.*, whether they will occur for a longer duration over sequential days or the comparative sound level that will be received). Ellison *et al.* (2012) and Moore and Barlow (2013), among others, emphasize the importance of context (*e.g.*, behavioral state of the animals, distance from the sound source) in evaluating behavioral responses of marine mammals to acoustic sources.

#### *Diel Cycle*

Many animals perform vital functions, such as feeding, resting, traveling, and socializing, on a diel cycle (24-hour cycle). Behavioral reactions to noise exposure (such as disruption of critical life functions, displacement, or avoidance of important habitat) are more likely to be significant for fitness if they last more than one diel cycle or recur on subsequent days (Southall *et al.* 2007). Consequently, a behavioral response lasting less than one day and not recurring on subsequent days is not considered particularly severe unless it could directly affect reproduction or survival (Southall *et al.* 2007). It is important to note the difference between behavioral reactions lasting or recurring over multiple days and anthropogenic activities lasting or recurring over multiple days (*e.g.*, vessel traffic noise). The duration of USAF activities utilizing explosives vary by mission category and weapon type. There are a maximum of 230 mission days planned in any given year, assuming every mission category utilizes all of their allotted mission days.

Many mission days feature only a single or limited number of explosive munitions. Explosive detonations on such days would likely last only a few seconds. There are likely to be days or weeks that pass without mission activities. Because of their short activity duration and the fact that they are in the open ocean and animals can easily move away, it is similarly unlikely that animals would be exposed for long, continuous amounts of time, or repeatedly, or demonstrate sustained behavioral responses. All of these factors make it unlikely that individuals would be exposed to the exercise for extended periods or on consecutive days.

#### *Temporary Threshold Shift*

NMFS and the USAF have estimated that some species and stocks of marine mammals may sustain some level of TTS from explosive detonations. In general, TTS can last from a few minutes to days, be of varying degree, and occur across various frequency bandwidths, all of which determine the severity of the impacts on the affected individual, which can range from minor to more severe. Explosives are generally referenced as broadband because of the various frequencies. Table 31 indicates the number of takes by TTS that may be incurred by different

species from exposure to explosives. The TTS sustained by an animal is primarily classified by three characteristics:

1. Frequency – Available data (of mid-frequency hearing specialists exposed to mid- or high-frequency sounds; Southall *et al.*, 2007) suggest that most TTS occurs in the frequency range of the source up to one octave higher than the source (with the maximum TTS at one-half octave above). TTS from explosives would be broadband.

2. Degree of the shift (*i.e.*, by how many dB the sensitivity of the hearing is reduced) – Generally, both the degree of TTS and the duration of TTS will be greater if the marine mammal is exposed to a higher level of energy (which would occur when the peak dB level is higher or the duration is longer). The threshold for the onset of TTS was discussed previously in this final rule. An animal would have to approach closer to the source or remain in the vicinity of the sound source appreciably longer to increase the received SEL. The sound resulting from an explosive detonation is considered an impulsive sound and shares important qualities (*i.e.*, short duration and fast rise time) with other impulsive sounds such as those produced by air guns. Given the anticipated duration and levels of sound exposure, we would not expect marine mammals to incur more than relatively low levels of TTS (*i.e.*, single digits of sensitivity loss).

3. Duration of TTS (recovery time) – In the TTS laboratory studies (as discussed in the **Potential Effects of Specified Activities on Marine Mammals and their Habitat** section of the proposed rule), some using exposures of almost an hour in duration or up to 217 SEL, almost all individuals recovered within 1 day (or less, often in minutes), although in one study (Finneran *et al.* 2007) recovery took 4 days. For the same reasons discussed in the **Analysis and Negligible Impact Determination - Diel Cycle** section, and because of the short distance animals would need to be from the sound source, it is unlikely that animals would be exposed to the levels necessary to induce TTS in subsequent time periods such that their recovery is impeded.

The TTS takes would be the result of exposure to explosive detonations (broad-band). As described above, we expect the majority of these takes to be in the form of mild (single-digit), short-term (minutes to hours) TTS. This means that for one time a year, for several minutes, a taken individual will have slightly diminished hearing sensitivity (slightly more than natural variation, but nowhere near total deafness). The expected results of any one of these small number of mild TTS occurrences could be that 1) it does not overlap signals that are pertinent to that animal in the given time period, 2) it overlaps parts of signals that are important to the animal, but not in a manner that impairs interpretation, or 3) it reduces detectability of an important signal to a small degree for a short amount of time – in which case the animal may be aware and be able to compensate (but there may be slight energetic cost), or the animal may have some reduced opportunities (*e.g.*, to detect prey) or reduced capabilities to react with maximum effectiveness (*e.g.*, to detect a predator or navigate optimally). However, given the small number of times that any individual might incur TTS, the low degree of TTS and the short anticipated duration, and the low likelihood that one of these instances would occur across a time period in which the specific TTS overlapped the entirety of a critical signal, it is unlikely that TTS of the nature expected to result from the USAF's activities would result in behavioral changes or other impacts that would impact any such individual's reproduction or survival.

#### *Auditory Masking*

The ultimate potential impacts of masking on an individual (if it were to occur) are similar to those discussed for TTS, but an important difference is that masking only occurs during the time of the signal, versus TTS, which continues beyond the duration of the signal. Fundamentally, masking is referred to as a chronic effect because one of the key potential harmful components of masking is its duration—the fact that an animal would have reduced ability to hear or interpret critical cues becomes much more likely to cause a problem the longer it is occurring. Also inherent in the concept of masking is the fact that the potential for the effect is only present during the times that the animal and the source are in close enough proximity for

the effect to occur (and further, this time period would need to coincide with a time that the animal was utilizing sounds at the masked frequency). As our analysis has indicated, because of the sound sources primarily involved in this rule, we do not expect the exposures with the potential for masking to be of a long duration. Masking is fundamentally more of a concern at lower frequencies, because low frequency signals propagate significantly further than higher frequencies and because they are more likely to overlap both the narrower low-frequency calls of mysticetes, as well as many non-communication cues, such as sounds from fish and invertebrate prey and geologic sounds that inform navigation. Masking is also more of a concern from continuous (versus intermittent) sources when there is no quiet time between a sound source within which auditory signals can be detected and interpreted. Explosions introduce low-frequency, broadband sounds into the environment, which could momentarily mask hearing thresholds in animals that are nearby, although sounds from missile and bomb explosions last for only a few seconds. Sound from gunnery ammunition, however, can last up to 90 minutes, although a 30-minute duration is more typical. Masking due to these relatively short duration detonations would not be significant. Effects of masking are only present when the sound from the explosion is present, and the effect is over the moment the sound is no longer detectable. Therefore, short-term exposure to the predominantly intermittent or single explosions are not expected to result in a meaningful amount of masking. For the reasons described here, any limited masking that could potentially occur from explosives would be minor, short-term and intermittent. Long-term consequences from physiological stress due to the sound of explosives would not be expected. In conclusion, masking is more likely to occur in the presence of broadband, relatively continuous noise sources, such as from vessels; however, the duration of temporal and spatial overlap with any individual animal would not be expected to result in more than short-term, low impact masking that would not affect reproduction or survival of individuals.

*Auditory Injury (Permanent Threshold Shift)*

Table 42 indicates the number of individuals of each species for which Level A harassment in the form of PTS resulting from exposure to or explosives is estimated to occur. The number of individuals to potentially incur PTS annually from explosives for each species ranges from 0 (Rice's whale) to 9 (bottlenose dolphin). As described previously, no species are expected to incur non-auditory injury from explosives.

As discussed previously, the USAF utilizes aerial, vessel and video monitoring to detect marine mammals for mitigation implementation, which is not taken into account when estimating take by PTS. Therefore, NMFS expects that Level A harassment is unlikely to occur at the authorized numbers. However, since it is difficult to quantify the degree to which the mitigation and avoidance will reduce the number of animals that might incur Level A harassment, NMFS plans to authorize take by Level A harassment at the numbers derived from the exposure model. These estimated Level A harassment take numbers represent the maximum number of instances in which marine mammals would be reasonably expected to incur PTS, and we have analyzed them accordingly. In relation to TTS, the likely consequences to the health of an individual that incurs PTS can range from mild to more serious depending upon the degree of PTS and the frequency band. Any PTS accrued as a result of exposure to USAF activities would be expected to be of a small amount (i.e., few dBs) due to required monitoring and mitigation measures. Permanent loss of some degree of hearing is a normal occurrence for older animals, and many animals are able to compensate for the shift, both in old age or at younger ages as the result of stressor exposure (Green *et al.* 1987; Houser *et al.* 2008; Ketten 2012). While a small loss of hearing sensitivity may include some degree of energetic costs for compensating or may mean some small loss of opportunities or detection capabilities, at the expected scale it would be unlikely to impact behaviors, opportunities, or detection capabilities to a degree that would interfere with reproductive success or survival of any individuals.

#### *Physiological Stress Response*

Some of the lower level physiological stress responses (*e.g.*, orientation or startle response, change in respiration, change in heart rate) discussed in the **Potential Effects of Specified Activities on Marine Mammals and their Habitat** would likely co-occur with the predicted harassments, although these responses are more difficult to detect and fewer data exist relating these responses to specific received levels of sound. However, we would not expect the USAF's generally short-term and intermittent activities to create conditions of long-term, continuous noise leading to long-term physiological stress responses in marine mammals that could affect reproduction or survival.

#### *Assessing the Number of Individuals Taken and the Likelihood of Repeated Takes*

The estimated takes by Level B harassment shown in Table 40 represent instances of take, not the number of individuals taken (the much lower and less frequent takes by Level A harassment are far more likely to be associated with separate individuals). As described previously, USAF modeling uses the best available science to predict the instances of exposure above certain acoustic thresholds, which are quantified as harassment takes. However, these numbers from the model do not identify whether and when the enumerated instances occur to the same individual marine mammal on different days, or how any such repeated takes may impact those individuals. One method that NMFS can use to help better understand the overall scope of the impacts is to compare the total instances of take against the abundance of that species (or stock if applicable). For example, if there are 100 estimated harassment takes in a population of 100, one can assume either that every individual will be exposed above acoustic thresholds in no more than 1 day, or that some smaller number will be exposed in one day but a few individuals will be exposed multiple days within a year and a few not exposed at all. Abundance percentage comparisons are less than 8 percent for all authorized species and stocks. This information in combination with the nature of the activities suggests that: 1) not all of the individuals will be taken, and many will not be taken at all; 2) barring specific circumstances suggesting repeated takes of individuals, the average or expected number of days taken for those individuals taken is

likely one per year; and 3) we would not expect any individuals to likely be taken more than a few times in a year. There are often extended periods of days or even weeks between individual mission days, although a small number of mission-days may occur consecutively. Marine mammals authorized for take in this area of the Gulf of Mexico have expansive ranges and are unlikely to congregate in a small area that would be subject to repeated mission-related exposures for an extended time.

**Table 40-- Annual Authorized Takes by Level A and Level B Harassment for Marine Mammals in the EGTR and the Number Indicating the Instances of Total Take as a Percentage of Stock Abundance**

Common Name	Stock/DPS	Annual Take by Level A and Level B Harassment			Total Take	Abundance (201 SARs)	Takes as a percentage of Abundance
		Behavioral Disturbance	TTS	PTS			
Common bottlenose dolphin	Northern Gulf of Mexico Continental Shelf	817	319	9	1145	63,280	1.8
Atlantic spotted dolphin	Northern Gulf of Mexico	100	39	1	140	21,506	0.6
Rice's whale*	--	4	2	0	6	51	11.8

\*ESA-listed species in EGTR

To assist in understanding what this analysis means, we clarify a few issues related to estimated takes and the analysis here. An individual that incurs PTS or TTS may sometimes, for example, also be subject to direct behavioral disturbance at the same time. As described above in this section, the degree of PTS, and the degree and duration of TTS, expected to be incurred from the USAF's activities are not expected to impact marine mammals such that their reproduction or

survival could be affected. Similarly, data do not suggest that a single instance in which an animal incurs PTS or TTS and also has an additional direct behavioral response would result in impacts to reproduction or survival. Accordingly, in analyzing the numbers of takes and the likelihood of repeated and sequential takes, we consider all the types of take, so that individuals potentially experiencing both threshold shift and direct behavioral responses are appropriately considered. The number of Level A harassment takes by PTS are so low for dolphin species (and zero for Rice's whale) compared to abundance numbers that it is considered highly unlikely that any individual would be taken at those levels more than once.

Occasional, milder behavioral reactions are unlikely to cause long-term consequences for individual animals or populations, and even if some smaller subset of the takes are in the form of longer (several hours or a day) and more severe responses, if they are not expected to be repeated over sequential days, impacts to individual fitness are not anticipated. Nearly all studies and experts agree that infrequent exposures of a single day or less are unlikely to impact an individual's overall energy budget (Farmer *et al.* 2018; Harris *et al.* 2017; NAS 2017; New *et al.* 2014; Southall *et al.* 2007; Villegas-Amtmann *et al.* 2015).

#### *Impacts to Marine Mammal Habitat*

Any impacts to marine mammal habitat are expected to be relatively minor. Noise and pressure waves resulting from live weapon detonations are not likely to result in long-term physical alterations of the water column or ocean floor. These effects are not expected to substantially affect prey availability, are of limited duration, and are intermittent. Impacts to marine fish were analyzed in our **Potential Effects of Specified Activities on Marine Mammals and their Habitat** section as well as in the 2022 REA (USAF 2022). NMFS acknowledges that explosive detonations can impact both fish and invertebrate prey sources in manners ranging from behavioral disturbance to mortality for animals that are very close to the source. However, as described in the analysis, these impacts are expected to be short term and localized and would be inconsequential to the fish and invertebrate populations and to the marine

mammals that use them as prey. In the REA, it was determined that fish populations were unlikely to be affected and prey availability for marine mammals would not be impaired. Other factors related to EGTTTR activities that could potentially affect marine mammal habitat include the introduction of metals, explosives and explosion by-products, other chemical materials, and debris into the water column and substrate due to the use of munitions and target vessels. However, the effects of each were analyzed in the REA and were determined to be not significant.

### *Species/Stock-specific Analyses*

This section builds on the broader discussion above and brings together the discussion of the different types and amounts of take that different species are likely to incur, the applicable mitigation, and the status of the species to support the negligible impact determinations for each species. We have described (above in the **Analysis and Negligible Impact Determination** section) the unlikelihood of any masking having effects that would impact the reproduction or survival of any of the individual marine mammals affected by the USAF's activities. We also described in the **Potential Effects of Specified Activities on Marine Mammals and their Habitat** section of this final rule the unlikelihood of any habitat impacts having effects that would impact the reproduction or survival of any of the individual marine mammals affected by the USAF's activities. There is no predicted non-auditory tissue damage from explosives for any species, and limited takes of dolphin species by PTS are predicted. Much of the discussion below focuses on the Level B harassment (behavioral disturbance and TTS) and the mitigation measures that reduce the probability or severity of effects. Because there are species-specific considerations, these are discussed below where necessary.

### *Rice's Whale*

The Gulf of Mexico Bryde's whale was listed as an endangered subspecies under the ESA in 2019. NMFS revised the common and scientific name of the listed animal in 2021 to Rice's whale and classification to a separate species to reflect the new scientifically accepted

taxonomy and nomenclature. NMFS has identified the core distribution area in the northern Gulf of Mexico where the Rice's whale is primarily found and, further, LaBreque *et al.* (2015) identify the area as a small and resident BIA. The Rice's whale has a very small estimated population size (51, Hayes *et al.* 2021) with limited distribution.

NMFS is proposing to allow for the authorization of two annual takes of Rice's whale by Level B harassment in the form of TTS and four annual takes by Level B harassment in the form of behavioral disturbance. The implementation of the required mitigation is expected to minimize the severity of any behavioral disturbance and TTS of Rice's whales. Monitoring reports under the LOA effective from 2018 through 2021 have not recorded take of any marine mammals. Only bottlenose dolphins have been observed, and there have not been sightings of whales of any species.

Rice's whale will benefit from the required mitigation measures to limit impacts to the species. As a mitigation measure to prevent any PTS and limit TTS and behavioral impacts to the Rice's whale, the USAF will restrict the use of live munitions in the western part of each LIA based on the setbacks from the 100-m isobath presented earlier. The USAF will also prohibit the use of inert munitions in Rice's whale habitat (100-400 m depth) throughout the EGTTR. The less impactful 105 mm Training Round must be used by the USAF for nighttime missions and all gunnery missions must be conducted 500 m landward of the 100-m isobath. Furthermore, depending on the mission category, vessel-based, aerial, or video feed monitoring would be required. Noise from explosions is broadband with most energy below a few hundred Hz; therefore, any reduction in hearing sensitivity from exposure to explosive sounds is likely to be broadband with effects predominantly at lower frequencies. The limited number of Rice's whales, estimated to be two animals, that do experience TTS from exposure to explosives may have reduced ability to detect biologically important sounds (*e.g.*, social vocalizations). However, any TTS that would occur would be of short duration (minutes to hours).

Research and observations show that if mysticetes are exposed to impulsive sounds such as those from explosives, they may react in a variety of ways, which may include alerting, startling, breaking off feeding dives and surfacing, diving or swimming away, changing vocalization, or showing no response at all (Department of Defense (DOD) 2017; Nowacek 2007; Richardson 1995; Southall *et al.* 2007). Overall, and in consideration of the context for an exposure, mysticetes have been observed to be more reactive to acoustic disturbance when a noise source is located directly in their path or the source is nearby (somewhat independent of the sound level) (Dunlop *et al.* 2016; Dunlop *et al.* 2018; Ellison *et al.* 2011; Friedlaender *et al.* 2016; Henderson *et al.* 2019; Malme *et al.* 1985; Richardson *et al.* 1995; Southall *et al.* 2007a). Animals disturbed while engaged in feeding or reproductive behaviors may be more likely to ignore or tolerate the disturbance and continue their natural behavior patterns. Because noise from most activities using explosives is short term and intermittent, and because detonations usually occur within a small area (most of which are set back from the primary area of Rice's whale use), behavioral reactions from Rice's whales, if they occur at all, are likely to be short term and of little to no significance.

As described, extensive operational and time/area mitigation measures for Rice's whales are expected to minimize the impacts of military testing and training activities to Rice's whales. The anticipated and authorized take of Rice's whale is of a low magnitude and severity that is not expected to impact the reproduction or survival of any individuals, much less population rates of recruitment or survival. Accordingly, we have found that the take authorized under the rule will have a negligible impact on Rice's whales.

### *Delphinids*

Neither the common bottlenose dolphin (Northern Gulf of Mexico continental shelf stock) or Atlantic spotted dolphin (Gulf of Mexico stock) are listed as strategic or depleted under the MMPA, and no active unusual mortality events (UME) have been declared. No mortality or non-auditory injury is predicted or authorized for either of these species. There are no areas of

known biological significance for dolphins in the EGTR. Repeated takes of the same individual animals would be unlikely. The number of PTS takes from the planned activities are low (one for Atlantic spotted dolphin; nine for common bottlenose dolphin). Because of the low degree of PTS discussed previously (*i.e.*, low amount of hearing sensitivity loss), it is unlikely to affect reproduction or survival of any individuals. Regarding the severity of individual takes by Level B harassment by behavioral disturbance, we have explained the duration of any exposure is expected to be between seconds and minutes (*i.e.*, relatively short duration) and the severity of takes by TTS are expected to be low-level, of short duration and not at a level that will impact reproduction or survival.

As described, the authorized take of dolphins is of a low magnitude and severity such that it is not expected to impact the reproduction or survival of any individuals, much less population rates of recruitment or survival. Accordingly, we have found that the take authorized under the final rule will have a negligible impact on common bottlenose dolphins and Atlantic spotted dolphins.

#### *Determination*

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, NMFS finds that the total marine mammal take from the specified activities will have a negligible impact on all affected marine mammal species. In addition, as described previously, the USAF's implementation of monitoring and mitigation measures would further reduce impacts to marine mammals.

#### **Unmitigable Adverse Impact Determination**

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of the species or stocks for taking for subsistence purposes.

#### **National Environmental Policy Act**

To comply with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216-6A, NMFS has adopted the Range Environmental Assessment (USAF 2022) developed by the USAF to consider the direct, indirect and cumulative effects to the human environment resulting from the USAF's action. The draft 2022 REA was made available for public comment on December 13, 2022, through January 28, 2023. In compliance with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations, as well as NOAA Administrative Order 216-6, NMFS has reviewed the USAF's REA, determined it to be sufficient, adopted that REA and signed a Finding of No Significant Impact (FONSI) on April 5, 2023.

### **Endangered Species Act**

There is one marine mammal species under NMFS jurisdiction that is listed as endangered under the ESA (16 U.S.C. 1531 *et seq.*) for which NMFS is authorizing incidental take in the EGTTTR; the Rice's whale. The USAF consulted with NMFS pursuant to section 7 of the ESA for EGTTTR activities, and NMFS also consulted internally on the promulgation of this rule and the issuance of an LOA under section 101(a)(5)(A) of the MMPA. NMFS issued a biological opinion concluding that the promulgation of the rule and issuance of a subsequent LOA are not likely to jeopardize the continued existence of threatened and endangered species under NMFS' jurisdiction. The biological opinion is available at <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities>.

### **National Marine Sanctuaries Act**

There are no National Marine Sanctuaries in the EGTTTR that would be affected by the USAF's planned activities.

### **Classification**

#### *Executive Order 12866*

The Office of Management and Budget has determined that this final rule is not significant for purposes of Executive Order 12866.

### *Regulatory Flexibility Act*

Pursuant to the Regulatory Flexibility Act (RFA), the Chief Counsel for Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy of the Small Business Administration that this final rule would not have a significant economic impact on a substantial number of small entities. The RFA requires Federal agencies to prepare an analysis of a rule's impact on small entities whenever the agency is required to publish a notice of proposed rulemaking. However, a Federal agency may certify, pursuant to 5 U.S.C. 605(b), that the action will not have a significant economic impact on a substantial number of small entities. The USAF is the sole entity that would be affected by this rulemaking, and the USAF is not a small governmental jurisdiction, small organization, or small business, as defined by the RFA. Any requirements imposed by an LOA issued pursuant to these regulations, and any monitoring or reporting requirements imposed by these regulations, would be applicable only to the USAF. NMFS does not expect the issuance of these regulations or the associated LOA to result in any impacts to small entities pursuant to the RFA. Because this action, if adopted, would directly affect the USAF and not a small entity, NMFS concludes that the action would not result in a significant economic impact on a substantial number of small entities. As a result, a final regulatory flexibility analysis is not required, and none has been prepared.

### *Waiver of Delay in Effective Date*

The Assistant Administrator for Fisheries has determined that there is good cause under the Administrative Procedure Act (5 U.S.C. 553(d)(3)) to waive the 30-day delay in the effective date of the final rule. The USAF is the only entity subject to the regulations and has informed NMFS that it requests that this final rule take effect by April 13, 2023, in order to prevent serious disruption of USAF testing and training activities that would result from any further delay in issuance of the LOA. Any postponement of enacting the final rule would (1) undermine 96th Operations Group support to Urgent Operational Need (UON/JUON) weapons tests and delay delivery of weapons capabilities to the warfighter (this would result in the deferment of four

known near-term test events), and (2) increase costs for multiple programs and test events at Eglin AFB, Tyndall AFB, and Hurlburt Field affected by the range suspension. The USAF is ready to implement the rule immediately. For all of these reasons, the Assistant Administrator finds good cause to waive the 30-day delay in the effective date.

### **List of Subjects in 50 CFR Part 218**

Exports, Fish, Imports, Incidental take, Indians, Labeling, Marine mammals, Penalties, Reporting and recordkeeping requirements, Seafood, Sonar, Transportation, USAF.

Dated: April 11, 2023.

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Samuel D. Rauch, III,

Deputy Assistant Administrator for Regulatory Programs,

National Marine Fisheries Service.

For the reasons set out in the preamble, NMFS amends 50 CFR part 218 as follows:

### **PART 218—REGULATIONS GOVERNING THE TAKING AND IMPORTING OF MARINE MAMMALS**

1. Add an authority citation for part 218 to read as follows:

**Authority:** 16 U.S.C. 1361 *et seq.*

2. Add subpart G, consisting of §§ 218.60 through 218.69, to read as follows:

#### **Subpart G – Taking and Importing Marine Mammals; U.S. Air Force’s Eglin Gulf Test and Training Range (EGTTR)**

Sec.

218.60 Specified activity and geographical region.

218.61 Effective dates.

218.62 Permissible methods of taking.

218.63 Prohibitions.

218.64 Mitigation requirements.

218.65 Requirements for monitoring and reporting.

218.66 Letters of Authorization.

218.67 Renewals and modifications of Letters of Authorization.

218.68 - 218.69 [Reserved]

#### **§ 218.60 Specified activity and geographical region.**

(a) Regulations in this subpart apply only to the U.S. Air Force (USAF) for the taking of marine mammals that occurs in the area described in paragraph (b) of this section and that occurs incidental to the activities listed in paragraph (c) of this section.

(b) The taking of marine mammals by the USAF under this subpart may be authorized in a Letter of Authorization (LOA) only if it occurs within the Eglin Gulf Test and Training Range (EGTTR). The EGTTR is located adjacent to Santa Rosa, Okaloosa, and Walton Counties and includes property on Santa Rosa Island and Cape San Blas. The EGTTR is the airspace controlled by Eglin Air Force Base (AFB) over the Gulf of Mexico, beginning 3 nautical miles (nmi) from shore, and the underlying Gulf of Mexico waters. The EGTTR extends southward and westward off the coast of Florida and encompasses approximately 102,000 square nautical miles (nmi<sup>2</sup>). It is subdivided into blocks of airspace that consist of Warning Areas W-155, W-151, W-470, W-168, and W-174 and Eglin Water Test Areas 1 through 6. The two primary components of the EGTTR Complex are Live Impact Area and East Live Impact Area.

(c) The taking of marine mammals by the USAF is only authorized if it occurs incidental to the USAF conducting training and testing activities, including air warfare and surface warfare training and testing activities.

#### **§ 218.61 Effective dates.**

Regulations in this subpart are effective from April 13, 2023, through April 13, 2030.

#### **§ 218.62 Permissible methods of taking.**

(a) Under an LOA issued pursuant to § 216.106 of this subchapter and § 218.66, the Holder of the LOA (hereinafter “USAF”) may incidentally, but not intentionally, take marine mammals within the area described in § 218.60(b) by Level A and Level B harassment (defined in section 3(18)(B) of the Marine Mammal Protection Act) associated training and testing

activities described in § 218.60(c) provided the activity is in compliance with all terms, conditions, and requirements of the regulations in this subpart and the applicable LOA.

(b) The incidental take of marine mammals by the activities listed in § 218.60(c) is limited to the species and stocks listed in table 1 to this paragraph (b). Only Level B Harassment of Rice's whales is authorized. Level A Harassment and level B Harassment of the two dolphin stocks are authorized.

**Table 1 to paragraph (b)**

Common Name	Scientific Name	Stock
Atlantic spotted dolphin	<i>Stenella frontalis</i>	Northern Gulf of Mexico
Common Bottlenose dolphin	<i>Tursiops truncatus</i>	Northern Gulf of Mexico Continental Shelf
Rice's whale	<i>Balaenoptera ricei</i>	No Stock Designated

**§ 218.63 Prohibitions.**

(a) Except for permissible incidental take described in § 218.62(a) and authorized by an LOA issued under § 216.106 of this subchapter and § 218.66, no person in connection with the activities listed in § 218.66 may do any of the following in connection with activities listed in § 218.60(c):

(1) Violate, or fail to comply with, the terms, conditions, or requirements of this subpart or an LOA issued under § 216.106 of this subchapter and § 218.66;

(2) Take any marine mammal not specified in § 218.62(b);

(3) Take any marine mammal specified in § 218.62(b) in any manner other than as specified in the LOA issued under § 216.106 of this subchapter and § 218.66;

(4) Take a marine mammal specified in § 218.62(b) after the National Marine Fisheries Service (NMFS) determines such taking results in more than a negligible impact on the species or stock of such marine mammal.

(b) [Reserved]

**§ 218.64 Mitigation requirements.**

(a) When conducting the activities identified in § 218.60(c), the mitigation measures contained in this subpart and any LOA issued under § 216.106 of this subchapter and § 218.66 must be implemented. These mitigation measures include, but are not limited to:

(1) *Operational measures.* Operational mitigation is mitigation that the USAF must implement whenever and wherever an applicable training or testing activity takes place within the EGTTTR for each mission-day category.

(i) *Pre-mission survey.* (A) All missions must occur during daylight hours with the exception of gunnery training, mission-day category K, and other missions that can have nighttime monitoring capabilities comparable to the nighttime monitoring capabilities of gunnery aircraft.

(B) USAF range-clearing vessels and marine mammal survey vessels must be onsite 90 minutes before mission to clear prescribed human safety zone and survey the mitigation zone for the given mission-day category.

(C) For all live missions except gunnery missions, USAF Protected Species Observers (PSOs) must monitor the mitigation zones as defined in table 1 to paragraph (a)(1)(i)(C)(5) of this section for the given mission-day category for a minimum of 30 minutes or until the entirety of the mitigation zone has been surveyed, whichever takes longer.

(I) The mitigation zone for live munitions must be defined by the mission-day category that most closely corresponds to the actual planned mission based on the predicted net explosive weight at impact (NEW<sub>i</sub>) to be released, as shown in table 1 to paragraph (a)(1)(i)(C)(5) of this section.

(2) The mitigation zone for inert munitions must be defined by the energy class that most closely corresponds to the actual planned mission, as shown in table 2 to paragraph (a)(1)(i)(D) of this section.

(3) The energy of the actual mission must be less than the energy of the identified mission-day category in terms of total NEW<sub>i</sub> as well as the largest single munition NEW<sub>i</sub>.

(4) For any gunnery missions PSOs must at a minimum monitor out to the mitigation zone distances shown in table 3 to paragraph (a)(1)(i)(D) of this section that applies for the corresponding energy class.

(5) Missions falling under mission-day categories A, B, C, and J, and all other missions when practicable must allot time to provide PSOs to vacate the human safety zone. While exiting, PSOs must observe the monitoring zone out to corresponding mission-day category as shown in table 1 to this paragraph (a)(1)(i)(C)(5).

**Table 1 to Paragraph (a)(1)(i)(C)(5) - Pre-mission Mitigation and Monitoring Zones (in m) for Live Missions Impact Area**

Mission-day Category	Mitigation Zone	Monitoring Zone <sup>5,6</sup>
A	1,130	TBD (to be determined)
B	1,170	TBD
C	1,090	TBD
D	950	TBD
E	960	TBD
F	710	TBD
G	9,260 <sup>1</sup>	550
H	9,260 <sup>2</sup>	450
I	280	TBD
J	1,360	TBD
K	890	TBD
L	780	TBD
M	580	TBD
N	500	TBD
O	370	TBD
P	410	TBD
Q	9,260 <sup>3</sup>	500
R	280 and 9,260 <sup>4</sup>	TBD
S	860	TBD

<sup>1</sup> For G, double the Level A harassment threshold distance (permanent threshold shift (PTS)) is 0.548 km, but G is AC-130 gunnery mission with an inherent mitigation zone of 9.260 km/5 nmi.

<sup>2</sup> For H, double the Level A harassment threshold distance (PTS) is 0.450 km, but H is AC-130 gunnery mission with an inherent mitigation zone of 9.260 km/5 nmi.

<sup>3</sup> For Q, double the Level A harassment threshold distance (PTS) is 0.494 km, but Q is AC-130 gunnery mission with an inherent mitigation zone of 9.260 km/5nmi.

<sup>4</sup> R has components of both gunnery and inert small diameter bomb. Double the Level A harassment threshold distance (PTS) is 0.278 km, however, for gunnery component the inherent mitigation zone would be 9.260 km.

<sup>5</sup> The monitoring zone for non-gunnery missions is the area between the mitigation zone and the human safety zone and is not standardized, as the human safety zone is not standardized. The human safety zone is determined per each mission by the Test Wing Safety Office based on the munition and parameters of its release (to include altitude, pitch, heading, and airspeed).

<sup>6</sup> Based on the operational altitudes of gunnery firing, and the only monitoring during mission coming from onboard the aircraft conducting the firing, the monitoring zone for gunnery missions will be a smaller area than the mitigation zone and be based on the field of view from the aircraft. These observable areas will at least be double the Level A harassment threshold distance (PTS) for the mission-day categories G, H, and Q (gunnery-only mission-day categories).

(D) Missions involving air-to-surface gunnery operations must conduct aerial monitoring of the mitigation zones, as described in the table 3 to this paragraph (a)(1)(i)(D).

**Table 2 to Paragraph (a)(1)(i)(D) -- Pre-mission Mitigation and Monitoring Zones (in m) for Inert Missions Impact Area**

Inert Impact Class (lb trinitrotoluene-equivalent (TNTeq))	Mitigation Zone	Monitoring Zone <sup>1</sup>
2	160	TBD
1	126	TBD
0.5	100	TBD
0.15	68	TBD

<sup>1</sup> The monitoring zone for non-gunnery missions is the area between the mitigation zone and the human safety zone and is not standardized, as the human safety zone (HSZ) is not standardized. The HSZ is determined per each mission by the Test Wing Safety Office based on the munition and parameters of its release (to include altitude, pitch, heading, and airspeed).

**Table 3 to Paragraph (a)(1)(i)(D) — Aerial Monitoring Requirements for Air-to-Surface Gunnery Operations**

Aircraft	Gunnery Round	Mitigation Zone	Monitoring Altitude	Operational Altitude
AC-30 Gunship	30 mm; 105 mm (FU and TR) <sup>1</sup>	5 nmi (9,260 m)	6,000 ft (1,828 m)	15,000 ft (4,572 m) to 20,000 ft (6,096 m)
CV-22 Osprey	.50 caliber	3 nmi (5,556 m)	1,000 ft (3,280 m)	1,000 ft (3,280 m)

<sup>1</sup>FU = Full Up; TR = Training Round.

(ii) *Mission postponement, relocation, or cancellation.* (A) If marine mammals other than the two authorized dolphin species for which take is authorized are observed in either the

mitigation zone or monitoring zone by PSOs, then mission activities must be cancelled for the remainder of the day.

(B) The mission must be postponed, relocated, or cancelled if either of the two authorized dolphin species are visually detected in the mitigation zone during the pre-mission survey.

Postponement must continue until the animals are confirmed to be outside of the mitigation zone and observed by a PSO to be heading away from the mitigation zone or until the animals are not seen again for 30 minutes.

(C) The mission must be postponed if marine mammal indicators (i.e., large schools of fish or large flocks of birds) are observed feeding at the surface within the mitigation zone.

Postponement must continue until these potential indicators are confirmed to be outside the mitigation zone.

(D) If either of the two authorized dolphin species are observed in the monitoring zone by PSOs when observation vessels are exiting the human safety zone, and if PSOs determine the marine mammals are heading toward the mitigation zone, then missions must either be postponed, relocated, or cancelled based on mission-specific test and environmental parameters. Postponement must continue until the animals are confirmed by a PSO to be heading away from the mitigation zone or until the animals are not seen again for 30 minutes.

(E) Aerial-based PSOs must look for potential indicators of marine mammal species presence, such as large schools of fish and large, active groups of birds.

(F) If marine mammal or potential indicators are detected in the mitigation area during pre-mission surveys or during the mission by aerial-based or video-based PSOs, operations must be immediately halted until the mitigation zone is clear of all marine mammals, or the mission must be relocated to another target area.

(iii) *Vessel avoidance measures.* Vessel operators must follow vessel strike avoidance measures.

(A) When any marine mammal is sighted, vessels must attempt to maintain a distance of

at least 150 ft (46 m) away from marine mammals and 300 ft (92 m) away from whales. Vessels must reduce speed and avoid abrupt changes in direction until the animal(s) has left the area.

(B) If a whale is sighted in a vessel's path or within 300 feet (92 m) from the vessel, the vessel speed must be reduced and the vessel's engine must be shifted to neutral. The engines must not be engaged until the animals are clear of the area.

(C) If a whale is sighted farther than 300 feet (92 m) from the vessel, the vessel must maintain a distance of 300 feet greater between the whale and the vessel's speed must be reduced to 10 knots or less.

(D) Vessels are required to stay 500 m away from the Rice's whale. If a baleen whale cannot be positively identified to species level then it must be assumed to be a Rice's whale and the 500 m separation distance must be maintained.

(E) Vessels must avoid transit in the core distribution area (CDA), as specified in the LOA issued under § 216.106 of this subchapter and § 218.66, and within the 100 - 400 m isobath zone outside the CDA. If transit in these areas is unavoidable, vessels must not exceed 10 knots and transit at night is prohibited.

(F) An exception to any vessel strike avoidance measure is for instances required for human safety, such as when members of the public need to be intercepted to secure the human safety zone, or when the safety of a vessel operations crew could be compromised.

(iv) *Gunnery-specific mitigation.* (A) If 105-mm rounds are used during nighttime gunnery missions they must be 105 mm training rounds. The USAF may only use 105-mm high-explosive (HE) rounds during daytime operations.

(B) Within a mission, firing must start with use of the lowest caliber munition and proceed to increasingly larger rounds.

(C) Any pause in live fire activities greater than 10 minutes must be followed by the re-initiation of pre-mission surveys.

(2) *Geographic mitigation measures--(i) Setbacks for Live Impact Areas (LIAs).* Use of

live munitions with surface or subsurface detonations is restricted in the western part of the existing LIA and East LIA such that activities may not occur seaward of the setbacks from the 100 m-isobath shown in table 4 to this paragraph (a)(2)(i).

**Table 4 to Paragraph (a)(2)(i) -- Setback Distances to Prevent Permanent Threshold Shift Impacts to the Rice's Whale**

User Group	Mission-Day Category	NEWi (lb)	Setback from 100-Meter Isobath (km)
53rd Weapons Evaluation Group (53 WEG)	A	2,413.6	7.323
	B	2,029.9	6.659
	C	1,376.2	5.277
	D	836.22	3.557
	E	934.9	3.192
Air Force Special Operations Command (AFSOC)	F	584.6	3.169
	I	29.6	0.394
96th Operations Group (96 OG)	J	946.8	5.188
	K	350	1.338
	L	627.1	3.315
	M	324.9	2.017
	N	238.1	1.815
	O	104.6	0.734
	P	130.8	0.787
	Q	94.4	0.667
	R	37.1	0.368
Naval School Explosive Ordnance Disposal (NAVSCOLEO D)	S	130	1.042

(ii) *Gunnery missions.* All gunnery missions must be conducted at least 500 meters landward of the 100-m isobath.

(iii) *Live munition prohibitions.* Use of live munitions with surface or subsurface detonations must be restricted to the LIA and East LIA and is prohibited from the area between the 100-m and 400-m isobaths.

(iv) *Inert munition restrictions.* Use of inert munitions is prohibited between the 100-m

and 400-m isobaths throughout the EGTTR.

(v) *Mission category K restrictions.* (A) Munitions under mission-day category K must be fired into the EGTTR inside of the LIAs and outside of the area between 100-m to 400-m isobaths

(B) Mission-day category K munitions must have a setback of 1.338 km from the 100-m isobath.

(C) Mission-day category K munitions may be fired into portions of the EGTTR outside the LIAs but must be outside the area between the 100-m and 400-m isobaths.

(3) *Environmental mitigation--(i) Sea state conditions.* Missions must be postponed or rescheduled if conditions exceed Beaufort sea state 4, which is defined as moderate breeze, breaking crests, numerous white caps, wind speed of 11 to 16 knots, and wave height of 3.3 to 6 feet.

(ii) *Daylight restrictions.* All live missions except for nighttime gunnery and mission-day category K will occur no earlier than 2 hours after sunrise and no later than 2 hours before sunset.

(b) [Reserved]

#### **§ 218.65 Requirements for monitoring and reporting.**

(a) *PSO training.* All personnel who conduct protected species monitoring must complete Eglin Air Force Base's (AFB) Marine Species Observer Training Course.

(1) Any person who will serve as a PSO for a particular mission must have completed the training within a year prior to the mission.

(2) For missions that require multiple survey platforms to cover a large area, a Lead Biologist must be designated to lead the monitoring and coordinate sighting information with the Test Director or Safety Officer.

(b) *Vessel-based monitoring.* (1) Survey vessels must run predetermined line transects, or survey routes that will provide sufficient coverage of the survey area.

(2) Monitoring must be conducted from the highest point feasible on the vessels.

(3) There must be at least two PSOs on each survey vessel.

(4) For missions that require multiple vessels to cover a large survey area, a Lead Biologist must be designated.

(i) The Lead Biologist must coordinate all survey efforts.

(ii) The Lead Biologist must compile sightings information from other vessels.

(iii) The Lead Biologist must inform Tower Control if the mitigation and monitoring zones are clear or not clear of marine mammal species.

(iv) If the area is not clear, the Lead Biologist must provide recommendations on whether the mission should be postponed or canceled.

(v) Tower Control must relay the Lead Biologist's recommendation to the Safety Officer. The Safety Officer and Test Director must collaborate regarding range conditions based on the information provided.

(vi) The Safety Officer must have the final authority on decisions regarding postponements and cancellations of missions.

(c) *Aerial-based monitoring.* (1) All mission-day categories require aerial-based monitoring, assuming assets are available and when such monitoring does not interfere with testing and training parameters required by mission proponents.

(2) Gunnery mission aircraft must also serve as aerial-based monitoring platforms.

(3) Aerial survey teams must consist of Eglin Natural Resources Office personnel or their designees aboard a non-mission aircraft or the mission aircrew.

(4) All aircraft personnel on non-mission and mission aircraft who are acting in the role of a PSO must have completed Eglin AFB's Marine Species Observer Training Course.

(5) One trained PSO in the aircraft must record data and relay information on species sightings, including the species (if possible), location, direction of movement, and number of animals, to the Lead Biologist.

(6) For gunnery missions, after arriving at the mission site and before initiating gun firing, the aircraft must fly at least two complete orbits around the target area out to the applicable monitoring zone at a minimum safe airspeed and appropriate monitoring altitude as shown in table 3 to § 218.64(a)(1)(i)(D).

(7) Aerial monitoring by aircraft must maintain a minimum ceiling of 305 m (1,000 feet) and visibility of 5.6 km (3 nmi) for effective monitoring efforts and flight safety as shown in table 3 to § 218.64(a)(1)(i)(D).

(8) Pre-mission aerial surveys conducted by gunnery aircrews in AC-130s must extend out 5 nmi (9,260 m) from the target location while aerial surveys in CV-22 aircraft must extend out from the target location to a range of 3 nmi (5,556 m) as shown in table 3 to § 218.64(a)(1)(i)(D).

(9) If the mission is relocated, the pre-mission survey procedures must be repeated in the new area.

(10) If multiple gunnery missions are conducted during the same flight, marine species monitoring must be conducted separately for each mission.

(11) During nighttime missions, night-vision goggles must be used.

(12) During nighttime missions, low-light electro-optical and infrared sensor systems on board the aircraft must be used for marine mammal species monitoring.

(13) Mission-day category K tests and any other missions that are conducted at nighttime must be supported by AC-130 aircraft with night-vision instrumentation or other platforms with comparable nighttime monitoring capabilities.

(14) For Mission-day category K missions, the pre-mission survey area must extend out to, at a minimum, double the Level A harassment (PTS) threshold distance for delphinids (0.89 km). Mission-day category K is estimated to have a PTS threshold distance of 0.445 km as shown in table 1 to this paragraph (c)(14).

**Table 1 to paragraph (c)(14) -- Bottlenose Dolphin Threshold Distances (in km) for Live Missions in the Existing Live Impact Area**

Mission-Day Category	Mortality	Level A Harassment				Level B Harassment		
		Slight Lung Injury	Gastrointestinal (GI) Tract Injury	PTS		Temporary Threshold Shift (TTS)		Behavioral
	Positive Impulse B: 248.4 Pa·s AS: 197.1 Pa·s	Positive Impulse B: 114.5 Pa·s AS: 90.9 Pa·s	Peak Sound Pressure Level (SPL) 237 dB	Weighted Sound Exposure Level (SEL) 185 dB	Peak SPL 230 dB	Weighted SEL 170 dB	Peak SPL 224 dB	Weighted SEL 165 dB
Bottlenose Dolphin								
A	0.139	0.276	0.194	0.562	0.389	5.59	0.706	9.538
B	0.128	0.254	0.180	0.581	0.361	5.215	0.655	8.937
C	0.100	0.199	0.144	0.543	0.289	4.459	0.524	7.568
D	0.100	0.199	0.144	0.471	0.289	3.251	0.524	5.664
E	0.068	0.136	0.103	0.479	0.207	3.272	0.377	5.88
F	0.128	0.254	0.180	0.352	0.362	2.338	0.655	4.596
G	0.027	0.054	0.048	0.274	0.093	1.095	0.165	2.488
H	0.010	0.019	0.021	0.225	0.040	0.809	0.071	1.409
I	0.025	0.049	0.045	0.136	0.087	0.536	0.154	0.918
J	0.228	0.449	0.306	0.678	0.615	3.458	1.115	6.193
K	0.158	0.313	0.222	0.258	0.445	1.263	0.808	2.663
L	0.139	0.276	0.194	0.347	0.389	2.35	0.706	4.656
M	0.068	0.136	0.103	0.286	0.207	1.446	0.377	3.508
N	0.073	0.145	0.113	0.25	0.225	1.432	0.404	2.935
O	0.046	0.092	0.078	0.185	0.155	0.795	0.278	1.878
P	0.046	0.092	0.078	0.204	0.155	0.907	0.278	2.172
Q	0.027	0.054	0.048	0.247	0.093	0.931	0.165	1.563
R	0.012	0.024	0.026	0.139	0.052	0.537	0.093	0.91
S	0.053	0.104	0.084	0.429	0.164	1.699	0.294	2.872

(d) *Video-based monitoring.* (1) All mission-day categories require video-based monitoring when practicable except for gunnery missions.

(2) A trained PSO (the video camera PSO) must monitor the live video feeds from the Gulf Range Armament Test Vessel (GRATV) transmitted to the Central Control Facility (CCF).

(3) The video camera PSO must report any marine mammal species sightings to the Safety Officer, who will also be at the CCF.

(4) The video camera PSO must have open lines of communication with the PSOs on vessels to facilitate real-time reporting of marine species sightings.

(5) Direct radio communication must be maintained between vessels, GRATV personnel, and Tower Control throughout the mission.

(6) If a marine mammal species is detected on the live video by a PSO prior to weapon release, the mission must be stopped immediately by the Safety Officer.

(7) Supplemental video monitoring by additional aerial assets must be used when practicable (*e.g.* balloons, unmanned aerial vehicles).

(e) *Post-mission monitoring.* (1) All marine mammal sightings must be documented on report forms that are submitted to the Eglin Natural Resources Office after the mission.

(2) For gunnery missions, following each mission, aircrews must conduct a post-mission survey beginning at the operational altitude and continuing through an orbiting descent to the designated monitoring altitude. The post-mission survey area will be the area covered in 30 minutes of observation in a direction down-current from the impact site or the actual pre-mission survey area, whichever is reached first.

(3) During post-mission monitoring, PSOs must survey the mission site for any dead or injured marine mammals. The post-mission survey area will be the area covered in 30 minutes of observation in a direction down-current from the impact site or the actual pre-mission survey area, whichever is reached first.

(f) *Acoustic monitoring.* (1) The USAF must conduct a single passive acoustic monitoring (PAM) study to investigate marine mammal vocalizations before, during, and after live missions that include underwater detonations in the EGTTTR.

(2) The USAF must further investigate ways to supplement its mitigation measures with the use of real-time PAM devices (*i.e.*, sonobuoys or hydrophones).

(3) These studies are contingent upon the availability of funding.

(4) Both studies must be approved by NMFS.

(g) *Annual monitoring report.* The USAF must submit an annual draft monitoring report to NMFS within 90 working days of the completion of each year's activities authorized by the LOA as well as a comprehensive summary report at the end of the project. The annual reports and final comprehensive report must be prepared and submitted within 30 days following resolution of any NMFS comments on the draft report. If no comments are received from NMFS within 30 days of receipt of the draft report, the report will be considered final. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments. The annual reports must contain the informational elements described in paragraphs (g)(1) through (5) of this section, at a minimum. The comprehensive 7-year report must include a summary of the monitoring information collected over the 7-year period (including summary tables), along with a discussion of the practicability and effectiveness of the mitigation and monitoring and any other important observations or discoveries.

(1) Dates and times (begin and end) of each EGTTR mission;

(2) Complete description of mission activities;

(3) Complete description of pre-and post-monitoring activities occurring during each mission;

(4) Environmental conditions during monitoring periods including Beaufort sea state and any other relevant weather conditions such as cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance; and

(5) Upon observation of a marine mammal, the following information should be collected:

(i) Observer who sighted the animal and observer location and activity at time of sighting;

(ii) Time of sighting;

(iii) Identification of the animal (*e.g.*, genus/species, lowest possible taxonomic level, or unidentified), observer confidence in identification, and the composition of the group if there is a mix of species;

(iv) Distances and bearings of each marine mammal observed in relation to the target site;

(v) Estimated number of animals including the minimum number, maximum number, and best estimate);

(vi) Estimated number of animals by cohort (*e.g.*, adults, juveniles, neonates, group composition etc.);

(vii) Estimated time that the animal(s) spent within each of the mitigation and monitoring zones;

(viii) Description of any marine mammal observed marine mammal behaviors (such as feeding or traveling) or changes in behavioral patterns (*e.g.*, changes in travel direction or speed, breaking off feeding, breaching), noting when they relate to known changes in activities;

(ix) Detailed information about implementation of any mitigation (*e.g.*, postponements, relocations and cancellations); and

(x) All PSO datasheets and/or raw sightings data.

(6) The final comprehensive report must include a summary of data collected as part of the annual reports.

(h) *Reporting dead or injured marine mammal.* (1) In the event that personnel involved in the monitoring activities discover an injured or dead marine mammal, the USAF must report the incident to NMFS Office of Protected Resources (OPR), and to the NMFS Southeast Region Marine Mammal Stranding Network Coordinator, as soon as feasible. If the death or injury was likely caused by the USAF's activity, the USAF must immediately cease the specified activities until NMFS OPR is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of this subpart and the LOA issued under § 216.106 of this subchapter and § 218.66.

(2) The USAF will not resume their activities until notified by NMFS. The report must include the following information:

(i) Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);

(ii) Species identification (if known) or description of the animal(s) involved;

(iii) Condition of the animal(s) (including carcass condition if the animal is dead);

(iv) Observed behaviors of the animal(s), if alive;

(v) If available, photographs or video footage of the animal(s); and

(vi) General circumstances under which the animal was discovered.

#### **§ 218.66 Letters of Authorization.**

(a) To incidentally take marine mammals pursuant to the regulations in this subpart, the USAF must apply for and obtain an LOA in accordance with § 216.106 of this subchapter.

(b) An LOA, unless suspended or revoked, may be effective seven years from the date of issuance.

(c) Except for changes made pursuant to the adaptive management provision of § 218.67(b)(1), in the event of projected changes to the activity or to mitigation, monitoring, or reporting required by an LOA issued under this subpart, the USAF must apply for and obtain a modification of the LOA as described in § 218.67.

(d) Each LOA will set forth:

(1) Permissible methods of incidental taking;

(2) Geographic areas for incidental taking;

(3) Means of effecting the least practicable adverse impact (*i.e.*, mitigation) on the species or stocks of marine mammals and their habitat; and

(4) Requirements for monitoring and reporting.

(e) Issuance of the LOA(s) must be based on a determination that the level of taking is consistent with the findings made for the total taking allowable under the regulations in this

subpart.

(f) Notice of issuance or denial of the LOA(s) will be published in the **Federal Register** within 30 days of a determination.

**§ 218.67 Renewals and modifications of Letters of Authorization.**

(a) An LOA issued under § 216.106 of this subchapter and § 218.66 for the activity identified in § 218.60(c) may be modified upon request by the applicant, consistent with paragraph (b) of this section, provided that any requested changes to the activity or to the mitigation, monitoring, or reporting measures (excluding changes made pursuant to the adaptive management provision in paragraph (b)(1) of this section) do not change the underlying findings made for the regulations in this subpart and do not result in more than a minor change in the total estimated number of takes (or distribution by species or years).

(b) An LOA issued under § 216.106 of this subchapter and § 218.66 may be modified by NMFS under the following circumstances:

(1) *Adaptive management.* After consulting with the USAF regarding the practicability of the modifications, NMFS may modify (including adding or removing measures) the existing mitigation, monitoring, or reporting measures if doing so creates a reasonable likelihood of more effectively accomplishing the goals of the mitigation and monitoring.

(i) Possible sources of data that could contribute to the decision to modify the mitigation, monitoring, or reporting measures in an LOA include:

(A) Results from USAF's annual monitoring report and annual exercise report from the previous year(s);

(B) Results from other marine mammal and/or sound research or studies;

(C) Results from specific stranding investigations; or

(D) Any information that reveals marine mammals may have been taken in a manner, extent, or number not authorized by the regulations in this subpart or subsequent LOAs.

(ii) If, through adaptive management, the modifications to the mitigation, monitoring, or

reporting measures are substantial, NMFS will publish a notice of a new proposed LOA in the **Federal Register** and solicit public comment.

(2) *Emergencies*. If NMFS determines that an emergency exists that poses a significant risk to the well-being of the species of marine mammals specified in LOAs issued pursuant to § 216.106 of this subchapter and § 218.66, an LOA may be modified without prior public notice or opportunity for public comment. Notice will be published in the **Federal Register** within thirty days of the action.

**§§ 218.68 - 218.69 [Reserved]**

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